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MOTOR AGE

MOTORING OVER HISTORIC OHIO GROUND

LYTLE AND PARTY ROLLING ALONG BEAUTIFUL ROAD THAT LEADS TO RUINS OF FORT MEIGS

TOLEDO, O., Aug. 19—From one end of this expansive and beautiful country to the other, from ocean to ocean, there is no stream or river but has its legend of primeval man and pioneer life. Not a hoary ancient of the forest but could tell tales of romance, tales of horror that would put the modern novelist to shame, by simply turning the pages of memory back a hundred years or so.

The better known of our historical landmarks long have claimed the attention of the tourist, bent on pleasure and sightseeing, but it is with the coming of the motor car that the minor points of interest—less generally known, but the scene of deeds of valor, nevertheless—are being rediscovered, and the luxurious descendants of grim pioneers turn their attention to those spots where a portion of the history of this great country was made, now that the motor car has made the visiting of these places a pleasant and comfortable possibility within the reach of every owner of a car.

There is no spot more rich in historic legendary lore and in scenes of natural beauty than the Maumee valley, once so thickly populated with those wild tribes whose necks never have bent to the yoke of civilization or servility.

This fact taken together with the splendid roads which abound in this section help to make Toledo and vicinity an ideal summer home for the enthusiastic motorist. Every foot of ground in the vicinity could tell a tale, every path leads to a romance or a massacre. Only the other day workmen unearthed in the heart of the city the bones of one long, long dead—a few old English coins, relics now, being the only possessions which survived the process of decay. Who was he? What story could he have told? A victim doubtless of murder when this country was a trackless wild and the soft-footed Indian trod silently, bringing death in his trail.

It was with feelings of keen anticipation that the Motor Age representative, whose pleasures are usually sandwiched between duties, accepted an invitation of Herbert Lytle to assist in escorting a party of capitalists about the various historic points in the immediate locality in his big Pope-Toledo touring car. The skies were bright, the air warm, and the lazy, singing noises of summer filled the ears as the big machine skimmed like a bird over the roads leading south from Toledo, toward Maumee city—toward the spot where a great battle was fought, and such scenes enacted that every true American feels his blood pulsating more rapidly as he contemplates them, and says with pride—aye, and reverence, too: "These, sir, were my ancestors."

On past the vineyards dotting the banks of the historic river the party sped, leaving behind at every revolution of the wheels some forgotten legend. At the little town of Perrysburg the motorists came upon an interesting relic of the days of yore. The old hotel, built in the earliest days, and known as Spafford's Exchange, has numbered among its guests many a man of note—General Harrison, Chief Justice Waite, and others of equal prominence. Here in the days of the mystic past, when the first court was held in this country, and judge and attorneys rode the circuit, came Presiding Judge Potter, together with his retinue of attorneys. The judge always occupied a suite of rooms over the bar room in the north-east corner, and every night he and his lawyers, gathered in the parlor of the old inn, discussed legal problems, told stories and in divers ways whiled away the lagging hours when court affairs were forgotten.

After looking over the old building, well preserved still, Lytle threw in his clutch and with a splutter and dash the Pope-Toledo swished on towards Maumee, a village now, but a flourishing, promising town when Toledo was not so much as a conception. Here, quiet and unpretentious, stands a small wooden structure, the first courthouse in the vicinity, about which one fateful day a dark and bloody history was made. It was May 4, 1813, when General Harrison and the redoubtable Chief Tecumseh were trying out the final issue that a troop of gallant horsemen, riding jauntily out from Kentucky to assist in finally subduing the redskins, arrived in the vicinity and sent to Harrison for instructions.

General Harrison, with his troops snug in Fort Meigs, had been greatly harassed by British guns planted directly across the river, so the order was returned to

ROAD RUNNING TO FORT MEIGS, SHOWING THE OLD RAMPARTS, WHICH STILL SURVIVE

"spike the guns." The instructions also commanded an immediate return to the protection of the fort. With the gallant Colonel Dudley in command the order was one to delight the hearts of the dashing Kentuckians, and brilliantly the work was done. British and Indians were routed, the guns spiked and the enemy seemed panic stricken. Mad with delight the Kentuckians, all of whom were volunteers unused to strict discipline, threw caution to the winds, and heedless of the commands of officers sped headlong after the panic-stricken enemy. But somewhere along the way the panic died out, the British and Indians, reinforced, turned, and retreat being also cut off the command was captured. Then followed the most frightful massacre anywhere recorded. An orgy of blood and carnage was indulged in by the savages, hundreds of scalps were taken, soldiers ran the gauntlet with squaws and children assisting in the mad revelry which lasted until the entire troop of nearly 1,000 men, with perhaps a dozen exceptions, were murdered in cold blood.

Placid now, the unused courthouse stands, a monument merely to the heroic deeds of long ago—but the spot bears a tender memory and the very trees seem haunted.

The jaunt took the motorists on through the little village past the place where stood until a few years ago an ancient elm tree about which clung a legend of an Indian who placed a block of wood among the topmost branches of the forest giant, and, seated thereon, at his leisure picked off with poisoned arrows Mad Anthony Wayne's soldiers who ventured to the river's edge to bathe or secure water. A number of soldiers were killed and wounded before the brave was discovered and dislodged. When the tree fell a few years ago the block was still in its place, though the bones of him who placed it there long had crumbled to dust.

The old Hull house, built as early as 1807 and occupied then by David Hull,

SIGN SHOWING LOCATION OF FORT MEIGS

nephew of the famous General Isaac Hull, one of Harrison's most trusted scouts, still stands, and, like Spafford's Exchange, has had for guests many men of fame and valor.

Out upon the road again the tourists passed away from the village to the twin forts—Miami and Meigs—where the very soil has been made sacred by the spilt blood of heroes. Fort Miami holds precedence by reason of age, for be it known that the spot where this fort now stands saw the first white settler who entered the Ohio country. Way back in 1680 Count de Frontenac, an energetic, farseeing governor of Canada, besought the French king to establish forts and trading posts along the great lakes. The king, busy with intrigues and court pleasures, paid no attention, but the governor, unable to stand idly by and permit others to snap up the rich plums, sent out trading parties to erect stores and posts and take possession of the country.

One of these parties found its way up the Maumee river and built a small stockade on the exact spot where Fort Miami now lies. The first white men to settle here permanently were Gabriel Godfrey and Batiste Beaugrand.

As time wore on the peaceable relations so long maintained between the French and Indians became strained, and in the year 1745 the French governor complained that the Indians "roasted all their prisoners." In that year the Miamis entered into the conspiracy with Nicholas, a great Huron chief who resided at Sandosket, on the bay of that name. Becoming incensed at the French, Nicholas permitted the English to build blockhouses at Sandusky. He formulated a plan for the extermination of Detroit and all other French trading posts. He consolidated eleven of the strongest and fiercest tribes of Indians, and when the plans of attack had been completed, in 1747, an overzealous Indian, unable to restrain his impatience, murdered a white, and fearing exposure a meeting of the chiefs was called to discuss the advisability of postponing the attack. A squaw overheard the deliberations and divulged the plot to a Jesuit priest. The settlers were immediately called to the fort at Detroit, aid was summoned from Quebec, and old Fort Miami was abandoned. The attack then was postponed, and in 1748 the French rebuilt the famous old Fort Miami and once again occupied it.

Then came Pontiac's great conspiracy, consolidating seven tribes against the whites. At this time the post of Miami was under command of Ensign Holmes, young, romantic, handsome. Far from the scenes of civilization, with no associates save the rough men of the camp, was it strange that the young man listened to the soft blandishments from the artful tongue of a dusky maid? In his house

INSIDE FORT MEIGS, SHOWING REMAINS OF EARTHWORKS

she dwelt, and when one sweet May morning she pleaded with him to visit a squaw who was seriously ill he had no thought of evil. He followed her away from his fort to the edge of the meadow, beyond where stood the Indian wigwams.

"There," said the girl, pointing to a wigwam, and on the instant from there sped two leaden missiles and the young ensign fell where he stood—victim of a dusky Delilah. The sergeant, hearing the shots, rushed out, only to be captured, and Fort Miami was surrendered. A few years later when Bradstreet came this way, headed for Detroit, young Captain Morris started on his adventure to the Illinois country and found a number of French soldiers still living at the post.

In 1794 came the dashing Wayne, and Fort Miami again became a military post. After the battle of Fallen Timbers and the defeat of the Indian allies under Chiefs Turkey Foot, Little Turtle and Blue Jacket the fort was finally evacuated July 11, 1795. From that day to this it has known not the panoplies of war, and today the grass grows over breastworks and embattlements, although these, with the mounds where soldiers are resting awaiting the bugle call of eternity, are plainly visible.

Across the way, not far distant, frowns Fort Meigs, built February 1, 1813, by old Tippecanoe Harrison, and named February 17, 1813, after Governor Return Jonathan Meigs. This fort is famous for withstanding two fierce sieges, the first from April 26, 1813, to May 4, when it was defended by General Harrison with 1,000 men, while Proctor and Tecumseh, with 3,200 men, assailed it from without. It was during this siege that the massacre of Dudley's Kentuckians occurred.

It was in July of the same year that the second siege took place. Harrison was still in command at the fort, and the besiegers, nearly 5,000 whites and Indians, were under Proctor. Proctor evolved a brilliant idea. He concluded to get up a sham battle among his own men just out of sight of the fort, expecting the soldiers there to make a dash which would end in his gaining possession of the fort. Wily old Tippecanoe was too deep, however, and the ruse failed to work, and Proctor soon after withdrew his men.

Here also remain visible evidences of the turmoil and strife of war, though it, as at Fort Miami, is sheathed in green.

Three miles south of Maumee the battle of Fallen Timbers was fought, although a portion of the battle actually took place within the limits of the town. In the spring of 1794 Mad Anthony Wayne pitched his tents and set up his fort at Defiance, where the Maumee and Auglaize rivers join.

POPE-TOLEDO RUNNING UP HILL—FORT MEIGS AT THE TOP

On August 18 of that year a council was held with Chiefs Little Turtle, Turkey Foot, Blue Jacket and Black Hoof, representing seven nations. Wayne made peace

OLD COURT HOUSE, NEAR DUDLEY'S FIELD

overtures, which were disdainfully rejected by the chiefs. The place where this council was held, Roche de Boeuf—Rock in the river—is still to be seen.

After the council the chiefs, under Turkey Foot, realizing that a battle was inevitable, selected for the scene of carnage a location at the foot of the rapids. A severe hurricane had just passed over the section, felling hundreds of trees, which the Indians looked upon as an almost impassable barrier.

The great warrior, Mad Anthony, led his men with bare blades to victory over those fallen timbers to the utter rout of the Indians, who never could withstand a bayonet charge. Bitter was the fighting and brilliant the deeds done that day. Old Chief Turkey Foot took a final stand on the great flat rock which still adorns the roadside, and to this day bears his name. Here he fought until death overcame him, and he fell with his warriors around him.

The Indians, in memory of that heroic occasion, carved quaint imitations of turkey feet on the rock, which are as plainly visible today as when first cut into the stone.

With minds full of these scenes and just as the shades of evening were falling Herbert Lytle turned the Pope-Toledo homeward, and the men in the car could feel a quivering along the spine—just enough to be romantic, mind you—as they thought of the bloody deeds of yore, and when one of the staid capitalists suddenly let out an imitation of an Indian war whoop the others felt the hair along their scalps raise ever so slightly. The car sped along and the scenes seemed even more romantic than they had in the morning. Passing Marengo park it seemed as if in the distance they could see that good and valiant warrior, old Chief Marengo himself, pacing, a silent sentinel about the place where once he lived, where he conducted a great battle and where now his crumbled bones have quietly slumbered for these many generations.

PEACEFUL FIELD WHERE ONCE WAS FORT MIAMI, MOUNDS BEING REMAINS OF OLD BREASTWORKS

POPE CASE IN TOLEDO

Labor Difficulties Said to Have Had Much To Do with Company's Financial Troubles

Toledo, O., Aug. 17—The curtain raised on what may prove to be the final act in the sensational labor difficulties of the Pope Motor Car Co. of this city, this week, when the petition was filed in the United States courts here, by the McManus-Kelley Co., praying that the defendant might be adjudged insolvent, asking for the appointment of a receiver for its business, and praying for an injunction restraining the officers and employes of the company from exercising any rights under its charter.

The petition filed alleges that the profits of the Toledo branch of the industry were in 1903, $55,000; in 1904, $441,000; in 1905, $781,000; in 1906, $461,000. Despite its troubles it is alleged that the Toledo plant will show a good profit for the stockholders again this year.

In the meantime it would seem that with assets aggregating $3,481,353, and with total liabilities fixed at only $512,972, and with the business of the company now in the hands of the court, under friendly receivers and managers and instructions to carry on the business, that it would only be a question of time until matters will be straightened out and in good working order again.

The suit is alleged to be a friendly one instituted for the purpose of floating the institution over certain stretches of deep water which are making their appearance, and preventing the dissipation of the assets of the concern by attachment and other numerous suits which it is said are sure to be instituted.

While the claim of the McManus-Kelley Co. is less than $5,000, and the assets of the company are alleged to be far in excess of its liabilities, its borrowing capacity of $1,000,000, which has heretofore been largely utilized, was on August 1 reduced to $250,000.

The difficulty actually began some time ago when the skilled employes of the Toledo plant went out on strike. This great labor battle was one of the fiercest ever known in this territory. For weeks the fight was unrelentingly waged. Nearly all the local courts were called into action to pass upon some phase of the situation or another. The United States court issued a sweeping injunction against the laborers involved, which was speedily followed by contempt proceeding after contempt proceeding in rapid succession. Even the newspapers were called into action in the attempt to influence popular sympathy for or against the participants.

After weeks of the most expensive and annoying warfare the labor troubles were finally amicably adjusted, through the kindly offices of Mayor Whitlock, and other public-spirited citizens. The financial difficulties growing out of the affair, it seems, were not to be so easily adjusted. While the long drawn out war was being waged work at the Toledo factory was being grievously retarded. Orders for 1907 deliveries soon fell far in arrears, order after order was canceled, until about 185 cars were left on the company's hands, entailing a loss in working capital of more than $250,000.

So long as the $1,000,000 borrowing capacity could be drawn upon, this was not a serious menace, as the cars were on hand to be counted in the assets, but when the borrowing capacity was curtailed to one-fourth of the amount, there came visions of future trouble. To avoid these difficulties, and effectually prevent myriads of small attachments which were threatening, the present action was instituted in the federal courts.

The statement is made that the receivership is but a temporary expedient to tide the company over serious breakers, and that its affairs will be finally adjusted in a satisfactory manner and the receiver discharged. In the meantime A. L. Pope was appointed receiver of the Pope Motor Car Co., as well as of the parent company, the Pope Mfg. Co., of Hartford, Conn. The receiver was ordered by the court to continue the business of the concern in the same manner as if no suit had been brought, exercising his own discretion in business matters, and with power to borrow $50,000 if needed for temporary use, and to report his doings to the court. A. E. Schaaf, manager of the Toledo plant, was appointed as Ohio manager for the receiver.

The parent company, which was originally engaged in the manufacture of bicycles, has been in business for nearly half a century. The subsidiary company was originally incorporated under the laws of New Jersey, in 1901, under the name of the International Motor Car Co., with a capital stock of $2,000,000. Later the name was changed to the Pope Motor Car Co. and the capital stock was reduced.

DEERE-CLARK IN TROUBLE

Moline, Ill., Aug. 15—The Deere-Clark Motor Car Co. today issued a circular letter to its creditors in which it announced that it was unable to meet the claims of its creditors. It said its capital stock had been paid in and expended and that the debts amounted to $100,000, with assets of $123,000. However, there is no money or quick assets available. There was a meeting of the resident stockholders on the 12th, at which it was decided to raise a fund to pay this debt, provided the non-resident stockholders contributed their share. It will take about 10 days to find this out. The company makes a frank statement of its condition and says if it is forced into bankruptcy there will be a shrinkage of about 50 per cent in the value of the assets of the concern.

RACING DATES IN EAST

September To Be a Lively Month, with Many Big Meets Scheduled—Labor Day Popular

Philadelphia, Pa., Aug. 20—The racing fever has taken a firm hold on the enthusiasts in the east and September promises to be a big month in that respect in this section. Point Breeze track, by reason of its propinquity to the haunts of men, has been decided on for the race meet of the Quaker City Motor Club, and by reason of the fact that the shore resorts usually attract so many Quakers the date first decided on, August 31, has been abandoned and the following Saturday, September 7, substituted. There will be but three events on the program—two 25-mile affairs and the keystone state championship at 100 miles. Montague Roberts and his Thomas, Dan Webster and the Frayer-Miller, the unlucky Jackson and several other of the 24-hour cracks are scheduled to start in the hundred, besides others. Of the 25-mile races, the first will be for catalogued runabouts and the other for $3,000 or less touring cars. The runabout affair was put on at the special request of half a dozen local owners and agents, each of whom has been carrying a chip on his shoulder all season and is just fairly aching to put it over the other fellows.

Next Saturday the Quaker city bunch is preparing to invade Reading, where a race meet is scheduled for the half-mile track there. At the last meet there, a month ago, there was intense rivalry among the Pullman, Pennsylvania and Wayne owners, and a feature will be a Pennsylvania-Pullman match race. A Maxwell-Ford battle is also on the tapis.

There will also be a meet at Ocean City, N. J., on Labor day. September 14 or 21 there will in all probability be another beach met at Atlantic City, and again the Quakers will be in evidence. Verily the speed merchants in and about the Pennsylvania metropolis have gala times ahead of them.

The Williamsport Automobile Club will celebrate Labor day with a sealed orders endurance run which will in all likelihood furnish considerable sport for the contestants. A marshal is now arranging all the details, and each starter will be handed a sealed envelope which must not be opened until a certain point is reached. Each envelope will contain all instructions, the objective point being the same for all, but the route varying according to the power of the car, the big cars having the longest distance and the hardest roads to travel. The Williamsporters are not a little worked up over the event.

The Bay State A. A. has issued its entry blanks for the race meet which it proposes to hold at Readville, Mass., Labor day. The list closes August 24. There are five events on the program and they

promise to be interesting. One event in particular, it is expected, will bring a number of good entries. It is a stripped chassis race for stock cars. The distance is 50 miles. There is no limit as to qualifications regarding price or power of fuel, so that steam and gasoline can try conclusions. There is also a race for touring cars open only to gasoline makes at 20 miles. Another 20-mile event is for runabouts, also gasoline. To give the steamers a chance a race at 10 miles for that class has been put in.

DULL IN TOLEDO

Toledo, O., Aug. 18—Little business is being done here now. An occasional sale which has been hanging fire for some time is completed, while a few trades, and an occasional unloading of a second-hand machine, keep up the spirits of the local dealers. The season has been one of general prosperity, however, and many cars have been sold. Considering the shortness of the season, it has been one of almost remarkable prosperity. Those who own cars are by no means idle. Every day is a holiday for some of them, and is improved diligently by pleasure riding. Those who have ventured northward through Michigan recently have encountered all kinds of griefs. Late rains throughout that section have rendered the roads well nigh impassable in places, and extremely unpleasant all the way. Stories of the hardships of motorists from those parts all coincide in the one essential feature that Michigan is not now a tourist's paradise. Scarcely a party returns from there but has some new tale of towed by mules or other hair-raising adventure. Tourists generally are on the move through here. From all over the country they continue to come and to go, and the local newspapers that a few years ago would have used the occurrence for a lead story do not even give them passing mention in their columns.

LIKE GOOD ROADS LAW

Grand Rapids, Mich., Aug. 19—There is a movement on foot in this city and in Kent county generally for the formation of a district to take advantage of the new good roads law. The board of trade has interested itself in the project and motorists in general are in favor of the proposed organization. The object is to secure state aid in the building of new roads and the improvement of old ones in this vicinity. The crusade started by Sheriff A. A. Carroll a short time ago against scorchers has borne fruit and there is very little speeding on the country roads in this vicinity. Owners of Muskegon, Hart and Kalamazoo have notified D. Emmett Welsh, secretary of the Michigan State Automobile Association, that they desire to become affiliated with the organization and a representative will be sent to these cities within a few days for the purpose of enrolling them.

AMERICA NOW SECOND

Statistics Show United States Ranks Next to France as an Exporter of Motor Cars

Washington, D. C., Aug. 19—A monograph on the subject of motor cars in the foreign trade of the United States and certain European countries has been prepared by the federal bureau of statistics. Among other things it sets forth that motor cars valued at more than $10,000,000 passed through the ports of the United States in its foreign trade in the fiscal year just ended. Five and a half million dollars' worth of these were exports and $4,500,000 worth imports. In addition to the export values about $100,000 worth of cars and parts went to Porto Rico, $160,000 worth to Hawaii, and about $5,000 worth to the Philippines, these being noncontiguous territories of the United States.

The United States occupies second rank among the commercial nations as an exporter of motor cars, being exceeded only by France. The value of motor cars entering international commerce is now about $35,000,000 per annum, and is rapidly increasing.

The foreign trade in motor cars shows a rapid growth, especially on the export side. The value of exports of cars and parts was, in 1902, a little less than $1,000,000; in 1903 it was $1,250,000; in 1904, $1,750,000; in 1905, $2,500,000; in 1906, $2,500,000, and in 1907 the value was $5,500,000.

On the import side the value of cars brought into the United States has only within the last 2 years justified the bureau of statistics in stating the imports separately, the value of cars imported in the fiscal year 1906 being $3,844,000, and parts thereof $400,000, while in 1907 the value of these vehicles imported was $4,041,000, and parts thereof $801,000. The growth in exports of motor cars is much more rapid than that in imports, and the value of cars exported seems likely in the near future to exceed by far the value of those imported into the country.

France, Italy, the United Kingdom and Germany supplied the $4,000,000 worth of cars imported during the year, nearly $3,000,000 worth of this being from France, a little less than a half million dollars' worth from Italy, and the remainder about equally divided between the United Kingdom and Germany. To nearly all countries the exports of cars during 1907 show a marked increase over those of 1906. The growth of exports of motor cars to the tropical sections of the world has been strongly marked. While the value of shipments of this class of merchandise to the United Kingdom only grew from $671,553 in 1902 to $1,520,304 in 1907, similar exports to Mexico grew from $27,710 in 1902 to $812,639 in 1907; those to the West Indies from $11,152 in 1902 to $207,390 in 1907; those to South America, from $15,353 in 1902 to $204,211 in 1907, and those to British Australasia, from $9,581 in 1902 to $207,715 in 1907.

Exports of cars to the tropical sections of the world were in 1907 more than ten times as much as in 1902, while those to other sections of the world were in 1907 but about five times as much as in 1902. About one-fourth of the motor cars exported from the United States are sent to the horseless areas of the world, including in this term China, Japan and the tropics, while from the United Kingdom nearly one-half of the $2,500,000 worth of cars exported in 1906 were sent to the tropics or the orient.

INDIANAPOLIS HAS A FIRE

Indianapolis, Ind., Aug. 17—The local plant of the Prest-o-Lite Co., one of the five owned by this concern, was damaged by fire this morning, the loss being placed at $25,000. The heat melted the little safety caps at the end of each tank and this released the gas, causing a most spectacular blaze. "This fire will not handicap us much," said President Carl G. Fisher. "We have thousands of charged Prest-o-Lite gas tanks and tire tanks on hand for immediate delivery from any of our other four main pumping stations at New York, Boston, Toronto or San Francisco. Besides, there are 20,000 dealers and garages well supplied, so there will be no trouble experienced changing empty tanks for charged ones. As Prest-o-Lite gas tanks are made on the same principle as that which has given Pullman palace cars and street cars everywhere now such a safe and steady lighting system, there were no features of the Indianapolis fire which could be regretted except the large fire loss to the company. An individual Prest-o-Lite gas tank is so strongly constructed and has such a delicate safety cap for preventing explosions from any cause that motorists are as absolutely safe in using them on their cars as if they were riding in a palace car on board a limited train. The company's Indianapolis plant will be immediately reconstructed."

MORRIS PARK IN GAME

New York, Aug. 20—The owners of the Morris Park race course have finally decided to do their own race promoting. Accordingly the Morris Park Motordrome Club has been formed. A. B. Tucker will be the manager and Al Camacho will be in charge of the track. Alfred Reeves, former manager of the track, will act in an advisory capacity. A series of meets will be promoted. The first will be run September 6-7 and include a 24-hour race, 25 and 50-mile races and several contests at 10 miles. Winthrop E. Scarritt and Walter C. Allen are interested in the venture. Prominent clubmen and tradesmen will be invited to join the club and every effort made to put racing on its proper scale.

PRESS CUP THE LAST

French Racing Calendar for 1907 Ends with the Lisieux Event, Taken by Renaux

Paris, Aug. 7—The last great French sporting event of the season came to an end today with the running of the press cup which was a climax to the criterium of France for touring cars. The criterium itself was stopped by the government because of accidents and Renaux in a Peugeot won the press cup. As regards the criterium, it is thought that the dangers on an unprotected route and the speeds at which drivers are tempted to travel will put an end to such extended tours as this and that future events of this sort will be raced over enclosed circuits like that at Lisieux, where 4,000 troops lined the roads and other traffic was kept off the track for the whole of the day.

All the machines, to the number of forty-eight, engaged in the criterium were standard touring cars, and the event in its conception and organization was a French counterpart of the Glidden tour. It was simply an endurance tour for the cars with the regulation that speed was not to exceed 25 miles per hour. Closed garages were provided at the end of each day's run and all repairs were made in the running time of the competing cars. It was the negligence of the speed limit rule which brought about the failure of the criterium, for, on Saturday last, when two or three stages of the tour had been covered and the competitors had been warned by the authorities about the speed at which they were driving their cars, the inevitable accident occurred, in which Villeman, who was driving a Martin-Lethimmonier car, was killed as were three or four other persons or drivers, by the car of the first named colliding with another going in the opposite direction. The tour was thereupon stopped by the direction of the French authorities and the cars were driven to the garage at Trouville, the scheduled end of the tour. The press cup race was allowed to take place and included in the field were the touring cars which had covered 1,200 miles of French roads during the previous few days which had been mapped out for the criterium.

There were just thirty competitors for the press cup, which was raced over the tarred 250 miles forming the Lisieux circuit, where great preparations had been made, equaling any of those for the grand prix. Sorel, the de Dietrich champion, was there; Barriaux d'Hespel, de la Touloubre, Dureste and other well known drivers were also handling cars, which included the Westinghouse, Mototbloc, de Dion, Peugeot, Lorraine-Dietrich, Mercedes, Rebour, Cottin Degouttes, Aries, Brillie, Charron and several other well-known makes.

The race was started at a quarter to 10 in the morning, a very convenient hour, and the cars got off at 2-minute intervals, with their allowance of 5 gallons of gasoline per 66 miles. This allowance is slightly more than was allowed to the sportive commisison cup cars which raced in the grand prix and more than half the 7 gallons per 66 miles allowed to the grand prix racers. The weights were considerably greater, though.

Sorel started the fun by making 50-mile laps in regular times of 52, 53 and 54 minutes respectively and he was kept at it by the Peugeot car of Renaux, which clipped in with laps of 54 and 55 minutes. Most of the finishers, and there were fourteen of these, made the laps regularly in less than an hour. Sorel's de Dietrich was looked upon as the sure winner of the day when he was stalled on the last lap, a few miles from the winning post, his final supply being exhausted. Renaux brought home his Peugeot car with plenty of gasoline to spare, the Peugeot cars being noted for their small fuel consumption and high average speed. He completed the 250 miles in 4 hours and 32 minutes, at the excellent rate of 54 miles per hour. This performance is considered excellent for an ordinary 40 horsepower touring car with a weight, without passengers, of 3,750 pounds. The Westinghouse car of Vimont was the next arrival. This car also was a 40 horsepower machine and weighed over 4,000 pounds empty. Vimont's average was 53 miles per hour. Zezele, the negro driver of a de Dion, had a look in as third and also brought his car home at an average of nearly 52 miles per hour. Another de Dion car was fourth, a Cottin was fifth and a Westinghouse car was sixth.

ALL FINISHERS WINNERS

Paris, Aug. 11—Prince Borghese, who arrived in Paris from his Pekin-Paris trip in his 40-horsepower Itala yesterday, was followed by a number of Itala cars which had picked him up on his way from Russia. The car is much battered by the voyage, but the motor runs well and after a slight overhauling could start on the 5,000-mile trip once more. Prince Borghese must not be looked upon as the winner, since everyone who finishes will be a winner. The Spyker and the two de Dions will come along in a few days, since their passage has been noted daily through the various towns of European Russia. The prince had a much more powerful car in the 40-horsepower Itala than did the remaining competitors, but inasmuch as the party had all arranged to remain together until Lake Baikal was safely passed, the reason for the prince leaving the others at the gates of Pekin has yet to be explained. So also has the failure of the de Dion and Spyker drivers to return to the succor of the Contal three-wheeler, which had run out of gasoline and was abandoned in the middle of the Gobi desert. It does not look as if the party hung together well, since the Spyker also was left to get along as best it could.

SEALED HOOD CAR IN

C. W. Price Drives Maxwell Into Chicago, Going 4478 Miles Without a Mishap

Chicago, Aug. 16—The return to Chicago of Charles W. Price from his rambles in the east in the No. 13 Maxwell touring car, which has been doing the sealed bonnet stunt since the Chicago reliability run June 26, was marked by a large outpouring of Maxwellites, who traveled all the way to Hobart, Ind., yesterday to give the glad hand to Price. The greeting over, the motoring cavalcade headed for Chicago, and as the car was run into the store of the Maxwell-Briscoe-Chase Co. the Springfield motometer showed that Price had covered 4,788 miles without disturbing the Chicago Motor Club seals. Harry Simpson accompanied Price on his trips.

A. F. Chase was responsible for the welcoming party at Hobart. He rallied the Maxwell forces and yesterday morning thirty-five Maxwell cars, each carrying a load of passengers, started for Hobart. It was raining then and all during the day showers dampened the motorists, but this did not prevent them from carrying out the program. Price had made Valparaiso the night before, and it was an easy jog over to Hobart. It had been planned to use the old camp-meeting grounds for the doings, winding up with a ball game and foot races. But the rain caused a change of plans. The Hobartites entered eagerly into the spirit of the affair and when it was found impossible to use the camp-meeting grounds the authorities promptly gave the motorists the use of the city hall, where dinner was served and Price formally welcomed home.

After reaching Chicago the Maxwell, dirty and dusty as it was, was installed in the front window of the Maxwell branch, its seals still unbroken. There it is now and there it will stay for several days. The seals are still unbroken, and it is the idea to keep the car on the move as long as possible without raising the bonnet. It is more than probable that it will be sent into the economy run of the Chicago Motor Club next month.

The Maxwell car did not gather in all the laurels on this long run. The parts and accessories people came in for a little of the glory. The car was equipped with Goodrich tires, which have stood the pounding of 4,788 miles with only four punctures. Price uses a Witherbee battery and Sta-rite spark plugs, while he gets his speed and distance from a Springfield motometer, all of which are the same as he started out with.

When Price contested in the reliability run of the Chicago Motor Club June 26 he had no idea of such a long grind. It was a sealed bonnet affair, and, of course the Maxwell was sealed the same as the others. It went through the reliability

with a perfect score and, like others, Price left the seals on the bonnet while he was giving demonstrations. Then came the 6-hour race at Peoria on the Fourth of July and Price drove the car down for the race, in which he made a most creditable drive. The seals still surviving, he drove back to Chicago, getting home just before the 24-hour race at Harlem. Into that he went with the now famous No. 13 and ran for 23 hours without letting anyone else handle the wheel. Then Mongini bumped him and the collision put out the Maxwell's rear axle, forcing Price to retire. But the seals still remained intact. Casting around for other stunts, the idea occurred to Manager Chase to send Price along with the Gliddenites from Chicago.

BROOKLANDS NOT A SUCCESS

London, Aug. 10—From all accounts the Brooklands racing track has nearly got to the bottom of the promoting syndicate's pocket. It is said that it is on the eve of being offered to the public as a commercial flotation, and if that is not successful the whole affair will be shut down indefinitely. So far the attendance of the public has never been as much as would do more than defray the cost of the day's racing, which averages about $10,000. S. F. Edge has been upbraiding the British manufacturers for leaving to him and his six-cylinder Napier cars the burden of vindicating Britain's position in the motor industry against Britain's continental rivals, but he has done very well in the way of prize money and no doubt thinks that he ought to continue to do even better if his British rivals helped to make the track racing game a good commercial speculation for the Brooklands people. But C. S. Rolls is just as emphatic against the fostering of Brooklands racing as Edge is in its favor, and it is claimed the majority of the British trade does not think that there is any commercial end to be gained by indulgence in track racing.

TIRE OF ROAD TESTS

London, Aug. 10—The wisdom of the elaborated system of hill-climb and reliability road tests which has taken possession of the trade from the beginning of April to the end of September is being discounted. The proposal of the Royal Automobile Club to run a 2,000-mile reliability trial next June will about turn the scale in favor of extinguishing the whole business. These competitions are not suited to small manufacturers and traders such as largely compose the British motor trade. They cost a lot of money for the results attained and as they must be attended to personally if any success is to be expected they draw the leading officials from factory and office away from business to attend to them. This 2,000-mile trial as announced seems to be a sort of 1,800-mile reliability test on the road with the tourist trophy race supervening.

CRY FOR PRIZE MONEY

Winners in Brighton Beach Meet Unable to Get Satisfaction From the Promoters

New York, Aug. 20—A cartoon in Puck many years ago pictured a small boy of an Hebraic cast of countenance standing in front of a peddler, one hand gripping a banana while the other tightly clasped a penny.

"Now, Ikey, you've got your banana, give the man your penny," said his mother.

"But I can't open my hand," replied Ikey.

Montague Roberts, who won $1,000 by his victory in the 24-hour race; Guy Vaughan, who has coming to him $250 of runabout sweepstakes money, and drivers of Packard and Lozier cars who are entitled to cups are trying hard to get what is coming to them from William H. Pickens, manager, and Joseph W. Gaites, of the United States Motor Car Racing Association, promoter of the recent meet at Brighton Beach. Roberts was promised his money yesterday, and when he went to get it was told by Gaites that the association was being sued right and left and that he didn't see just where the Thomas pilot came in for any money, for the present at least.

This is the story that Harry Houpt, the backer of Roberts, tells the Motor Age correspondent. Houpt is preparing a demand on the A. A. A., which sanctioned the meet, and on the Long Island Automobile Club, under whose published auspices it was run, for the collection of the money due Roberts.

Vaughan and the Lozier and Packard people have so far got from Gaites nothing better than promises. Pickens is disporting himself in the waves at Asbury Park.

On the night of the finish of the big meet Pickens came to A. R. Pardington with an offer to place in his hands the $1,000 for Roberts.

"I did not care to be made a depository for so large an amount at that late hour of the night," says the pro tem racing board chairman, "and introduced Pickens to C. J. Edwards, treasurer of the L. I. A. C., one of the referees. Pickens told me that expenses and the past indebtedness had been heavy, but that the association had come out pretty nearly even and was ready to pay over the prize money. I had supposed Roberts had received his money up to my return to town last Thursday, when I learned the contrary. I have been trying to reach Gaites, but have so far failed. If the money be not paid we will suspend the U. S. M. C. R. A. and all concerned.

"The Long Island Automobile Club," he continued, "received a small percentage for managing and officering the meet. It had a contract relieving itself of all financial liability. Today a letter of complaint came to me from a winner at the Minneapolis meet that he had been unable to get his prize."

The A. A. A., in view of the present occurrence, will soon be up against a strong demand that it amend its rules or procedure to safeguard entrants to meets sanctioned by its racing board. The criticism is made that clubs which lend their names to individual promoters for a share of the gate receipts should be made also responsible for the payment of prizes to entrants on the strength of the club's name. The feeling here is that if long-distance track racing is to continue it is up to the A. A. A. to cast safeguards around it for the protection of all concerned.

Pickens made the statement to friends at the time of the Brighton Beach meet that the United States Motor Racing Association was $8,000 behind on the season's promotions. The same source is credited with the statement that the gate receipts at Brighton Beach were $12,000 and the expenses $6,500. To the gate receipts were to be added money received from privileges, program advertising and entry fees.

FRANKLIN AFTER RECORD

Chicago, Aug. 21—With the Chicago-New York record of 56 hours 58 minutes already credited to their six-cylinder model, the Franklin people at 3 o'clock this morning dispatched a 1908 16-horsepower four-cylinder runabout over the classic route in an effort to improve on the time. Following the usual Franklin procedure, there are four men in the crew —Carris, Dailey, Bates and Talbot—and the affair is being run in relays, the three extra drivers going ahead by train. An average pace of 17 miles an hour is figured on and it is believed the record will be smashed easily. The official start was made from in front of the headquarters of the Chicago Motor Club in the New Southern hotel at Michigan avenue and Thirteenth street, Dailey taking the first trick. Messages received by Manager Thomas, of the local Franklin branch, stated that the runabout had passed through South Bend at 6:20 o'clock a. m. and had reached Bryan, O., at 11 o'clock, ahead of record and with the car running well. At 1:05 p. m. the car left Toledo, 267 miles out, 2 hours 25 minutes ahead of schedule.

PLAN CONDUIT SPEEDWAY

New York, Aug. 20—A scheme is on foot to construct a 30-mile motor speedway on top of the water conduit between Highland Park, a suburb of Brooklyn, and Massapequa. At a recent meeting of the board of aldermen a resolution was passed favoring the project and Comptroller Metz, Water Commissioner O'Brien and Nelson P. Lewis, an engineer of the board of estimate, were appointed a committee.

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WHERE THE INDUSTRY SEEMS TO STAND

WHATEVER apprehension happens to exist as to the future of the industry because of the failure of a small number of concerns engaged in the manufacture of motor cars should have none but a salutary effect on the industry as a whole if the situation is viewed from a common-sense point. As Motor Age pointed out some time ago, it is but natural there should develop some weak spots in the trade; that even with the best of times these weak spots must show themselves and that quite naturally should the weak spots be removed, just as a manufacturer of motor cars discovers and removes the weak spots in his own production in order to approach perfection.

If one considers the ordinary run of business concerns, the number that are started and those that survive, it will be granted the motor car industry has fared far better than almost any other line, inasmuch as there have been comparatively few failures in either the manufacturing or retail branches. It is not a difficult thing to find legitimate reasons for most of the failures that have been recorded; in no case has a failure been because of a lack for a market or even for the reason that the product was not what was wanted by the public.

It would indeed be strange if the motor car industry could go on for an indefinite period without there being some evidence of weakness in a number of concerns, so far as finance, sales, construction and business ability are concerned. The wonder is that these weaknesses have not cropped out before, but this may be explained by the fact that people have seen something good as an investment and have been prevailed upon to continue to dump in coin, only to learn that it required more than mere cash to successfully conduct a motor car manufacturing concern.

The concerns that are being conducted on sound business principles, that make good goods, that are being carefully financed are not apt to see the tall form of Failure come stalking before them—they are as sound as are the concerns of other lines that are well and sensibly conducted. The case of the Pope company is probably out of the ordinary, for its fight with labor cost it a considerable sum of money because of its inability to turn out goods and realize a profit thereon.

Most of the reliable makers of motor cars had no difficulty in finding a ready sale for their 1907 goods and there are some that are even now behind in deliveries to a small extent owing to late orders. There has been a remarkable demand for cars this year and the demand has kept up all through the summer, owing perhaps to the lateness of the spring. There is still a demand; there is a demand already for 1908 cars; the demand for cars another year will be greater than it was in 1907 or any previous year.

It will be learned that those concerns that are wont to make an entirely different model each year will be the ones that will find themselves in deep water, inasmuch as a policy of a complete yearly change must naturally prove too expensive for the strongest to stand. It is possible too many motor car manufacturing concerns have been launched; it is certain there have been too many inexperienced people dabbling in a game of which they know nothing and in which they cannot hope to succeed. It will take some time to weed these people out of the industry, but their absence will bring a clearer and more wholesome atmosphere. It was but natural that the industry should be handicapped by such weights and it is only natural these drawbacks should be eliminated.

Motoring has gained in popularity so fast and with such apparent real strength that no one will entertain the idea that the demand for cars another year will not greatly exceed that of the present season, but whether the demand will keep pace with the increased facilities for enlarging outputs will have to be discovered some time in the future.

The transactions of the past few weeks are such as to cause the older establishments to look carefully into their own prospects, into the matter of disposing of their products and to realize that it will be far better to keep the demand beyond the supply rather than to be responsible for aiding in helping to cause an over production and the consequent flooding of the market of machines thrown together in any old way simply to realize a little profit thereon. The little financial flurry will be the means of heading off overproduction and, coming at the end of the season, is not apt to leave the market overstocked to the etxent of calling it overproduction. It will have the effect of making the parts makers cautious and this in itself will prove a decided safeguard and a check on recklessness.

So long as the business is conducted on business principles and with a desire to guard the interests of the industry as an industry and so long as self interests do not crop up to crowd out the better judgment that ought to be exercised for the benefit of all, the motor car industry will naturally enough thrive.

TRACK RACING HAS APPARENTLY FAILED

BRITISH motorists have discovered that track racing is not meeting with the approval of the public to the extent that the public is supporting the greatest speedway that has ever been made and which was demanded by those who believed in racing. At the present time the great Brookland 3½-mile cement track is proving anything but a financial success and its promoters are considering the advisability of calling upon the general public for subscriptions to keep the affair alive. It would be only natural that a great many people should find amusement in track racing, but it must be remembered it is an exceedingly expensive game, with little reward beyond the advertising value that accrues to the winner, and that the trade alone must be relied upon to furnish the amusement that is to be given the public which witnesses the contests. This form of advertising is too expensive for the strongest concern in the world to consider as something of a regular nature and naturally enough racing on tracks must see its day sooner or later. Even the big road events are beginning to feel lack of that kind of interest that tends to show to the maker who supports them that he is warranted in spending his time and money in this sort of advertising. It is true some of the big road events abroad have filled the public with more or less enthusiasm, but considering the growth of the motor car industry, and the thousands of additions to the ranks of motorists, the enthusiasm has by no means kept up its pace. It must be admitted that what will fit one section of the country will not fit another, so that if racing of any sort or contests of any nature are to be conducted for the benefit of the trade in general it will be necessary for the promoters to study with great care the time, place and circumstances and frame their events with a view of doing the greatest amount of good for the greatest number of people rather than attempt to merely run contests for the sake of running them and with a view of making money out of them.

GENEROSITY on the part of the promoters of the Pekin-Paris race resulted in all the finishers being declared winners. There was of course a first to finish, but the hardships endured on the trip were so great and the records of the cars so good—so long as they even went the route—that each and every car ought to get some glory out of it. Furthermore, all the cars except a three-wheeler finished and thereby again showed of what the motor car is capable, to say nothing of introducing it into the wilds of China and Siberia, possible future markets.

SUCH a stunt as going something in the neighborhood of 5,000 miles without touching the motor, the coil or the spark plugs—that is what a Maxwell has just done, with Charles W. Price as driver—is about as convincing argument that it is unnecessary to tinker with a motor as could be desired. Of course there must be quality in the motor and ability in the driver, but what one man can do so can another and this little exhibition ought to make some of the motorists who visit repair shops almost daily feel a little ashamed of themselves.

WHEN the authorities of France stopped the running of the criterium they probably paved the way to put an end to accidents in similar contests of the future, inasmuch as such affairs will probably be over guarded routes hereafter. The government of France is interested in the welfare of its industries and particularly in that of the motor car; it also keeps a fatherly eye upon its people, and while it does not propose to end such contests as tend to promote the welfare of the industry it will not permit the public to suffer in the least. That is the difference between France and America.

ENGLAND has become tired of promoting hill-climbs and reliability runs because such affairs are usually participated in by the trade and take too many of the factory employes away from their work at times when their services are needed. For this reason it is now proposed to hold a 2,000-mile reliability run, to include the contest for the tourist trophy, and to finish at the new Brooklands track. This may work in England because of its size, but it would hardly be a success in this country, where the manufacturing centers are so widely separated. It is more than likely, however, that another year will see entirely different arrangements for the conduct of all the American contests, and more particularly that for the Glidden trophy. If the A. A. A. contest is to remain a "tour" then it will be in line for the N. A. A. M. to organize a lady-like affair extending over a period of a couple weeks, with the pace not to exceed 15 miles an hour, and to be termed an "endurance contest."

HAVING become dissatisfied with the manner the A. A. A. conducts its tours and other contests, the Importers' Salon has decided to attempt to form a combination for the purpose of running such affairs on lines that will, it hopes, be more modern and more satisfactory in determining the true qualities of one car against another. It has been claimed this movement is simply one for the benefit of the importers and against the A. A. A., but even if this is the case the A. A. A. ought to be strong enough to meet it if it is capable of being the governing body.

CHICAGO'S recent 24-hour race, over which there has been such a nasty odor for several weeks, is soon to be investigated by a committee appointed for the purpose. Inasmuch as this has brought out all sorts of charges and counter charges and has been responsible for placing the name of Chicago, one of her motor clubs and her motorists in general in an unfavorable light, this committee should leave nothing undone to discover the truth of the case and to have no hesitancy in reporting its findings, hit whom it may. In order that the truth may be known, the investigating committee should sit behind open doors so the world may know all one man may have to say of another. A thorough investigation, together with an unbiased and unabridged report duly made public, ought to be the means of clearing the atmosphere to a remarkable extent—and it needs clearing.

HOW long must the racing interests of this country be inflicted with promoters who do not carry out their promises, and how long will the American Automobile Association, the guardian of racing, stand for all the criticism these people cause? If Chairman Thompson, of the racing board, is sightless and deaf to all that is reported from week to week, then he is not warranted in holding the position the A. A. A. has given him; if he is aware of all that is taking place, and does not deem it necessary to offer some sort of explanation, he ought to be asked to step down and out. Usually where there is smoke some evidence of fire is to be found, but whether there is any truth in the reports or not the nasty stories are abroad and ought to be investigated.

HARDLY a week passes that Motor Age is not asked what has become of the American Automobile Association or the American Motor League. To be frank, Motor Age does not know, but inasmuch as extreme calm portends a storm perhaps there will be something doing ere long. Perhaps! Yes, perhaps!

THE WEEK IN BRIEF

English makers said to be tiring of so many hill-climbs and reliability tests and hereafter will devote their energies to big 2,000-mile run, scheduled for next year.

Builders of Brooklands track in England reported to be ready to let public subscribe for stock; meetings so far said to have been financial failures.

Charles W. Price, driving Maxwell sealed bonnet car, returns to Chicago, having covered 4,788 miles without lifting hood; seals are still intact.

Press cup race is last event on French calendar and is won by Renaux in a Peugeot; government stops the criterium.

Franklin four-cylinder runabout starts after Chicago-New York record of 56 hours 58 minutes, leaving Chicago Wednesday morning.

Prize winners in recent Brighton Beach meet complain of failure of Promoters Gaites and Pickens to pay up.

Series of race meets to be promoted by owners of Morris Park track, New York; first meet September 6-7.

Scheme sprung to construct 30-mile motor speedway on top of water conduit between Highland Park, N. Y., and Massapequa.

COMING MOTOR EVENTS

Chicago Economy Test—Second annual economy test of the Chicago Motor Club and Chicago Automobile Trade Association, September 6 or September 13.

St. Louis Reliability Run—Automobile Club of St. Louis, 90-mile reliability run for owners only, September 14.

A. C. C. Show—Automobile Club of America's annual show at Grand Central palace, New York, week of October 24-31.

New York Show—A. L. A. M. show, Madison Square garden, October 31 to November 7. Marcus I. Brock, 7 East Forty-second street, New York.

Chicago Shows—Eighth annual Chicago show, Coliseum, and first commercial vehicle show at Seventh Regiment armory, both November 30 to December 7. S. A. Miles, manager, 7 East Forty-second street, New York.

Chicago Commercial Test—First annual test of commercial cars, Chicago Motor Club, November 30 to December 7.

Importers' Show—Importers' Automobile Salon exhibit of pleasure and commercial vehicles in Madison Square garden, New York, December 28-January 4.

SOME TRENDS of MODERN AUTOMOBILE DESIGN*

By Victor Lougheed

PART IV

Different Types of Motors Compared—Ignition Troubles—Air and Mixture Volumes—Lougheed's New Motor in Detail

FROM what has been said it must be conceded that there are many objections to the present cycles of engine operation, and that, if there is any merit in the conclusions already advanced by the writer, these objections are likely to be largely done away with in the near future. For example, it has been suggested that there is reason to believe that the individual charges can be expanded nearly to atmospheric pressure, as has been attempted after a fashion by the use of compound-engine constructions. This idea is all right—that of increasing the power output by carrying out the expansion—but the practicability of realizing it by transferring the charges from one cylinder to another never has been demonstrated to the satisfaction of engineers really competent to pass judgment upon the whole proposition. It is too much to expect continued expansion from a cylinderful of hot gases, when under a pressure that is maintained solely by heat that is rapidly wasting to the cylinder wall; they are sent through a comparatively small valve port into another and larger cylinder, there to come in contact with more comparatively cool combustion chamber walls. A more probable result is cooling until the pressure is out of the gases, instead of expansion until it is out. It is true that in this way the necessity for a muffler may be escaped, but no material increase of power can be gained.

Four-Cylinder Engines

Exhaust at high pressure with the present types of four-cycle motors is the direct cause of three foremost difficulties. The first of these is the reduced efficiency, due to the failure to expand the charge to its limit behind the piston; the second is the heating effect, which results from exhausting before the high temperature of the charge is transformed into work; and the third is necessity for the muffler, which further reduces efficiency by setting a back pressure against the engine, besides which it adds complication and increases the heating of the exhaust valve, which, as every designer knows, is the most difficult place in a four-cycle engine to keep cool.

Necessity for separate exhaust and inlet valves on an ordinary four-cycle engine cylinder is almost a direct result of the use of the carbureter and muffler. With these two eliminated there is little good reason why the air component of the fuel charge should not come in through the same opening that affords exit to the exhaust gases.

Compression varied by throttling is another great defect of the approved type of motor car engine. If, as is generally conceded, high compression is essential to high efficiency, what must be true of the average efficiency of the usual motor car engine, which works most of the time at much below its full power capacity? The answer can be found in tests made, not under conditions of highest efficiency, but under conditions simulating those of average running. Moreover, in addition to the desired throttling by the controlling means, there is the undesired throttling by wire-drawing. And it is a fact well proved by laboratory tests that many modern motor car engines, when running at their highest speeds, do not inspire even a third of a full charge during the suction stroke.

Attempts to improve the Otto type of four-cycle engine have been very numerous, and some of the results are very significant when viewed in the light of the writer's contentions. Among the more notable and successful of these modified cycles are the Atkinson, the Diesel and the Sargent. In the Atkinson engine, by the complication of an ingenious toggle-joint crank-and-connecting-rod mechanism, the piston on the explosion stroke is caused to travel twice as far as it does on the suction stroke—with the result of expanding the charge so nearly to atmospheric pressure that the muffler is dispensed with and efficiency much increased. And by a similar variation of the piston travel in the compression and exhaust strokes, at the termination of the latter there is practically no clearance between the piston and the cylinder head, so the exhaust gases are scavenged out completely. This engine is no longer manufactured, because of its mechanical complication.

In the Diesel engines extraordinarily high compression is used and pure-air volumes are inspired, to be carbureted by pump injections of fuel after they are in the cylinder. The fuel, which may be of the heaviest grades of crude oil, is ignited solely by the heat imparted by the compression, which is in the neighborhood of 500 pounds to the square inch. The expansion is carried down close to atmosphere by the expedient of cutting off the fuel injection before its quantity is such as to utilize all the air in the cylinder, and the compression space is so small that there is very little clearance to retain exhaust gases. This engine is illustrated in figure 18. The Diesel engine is the most efficient heat motor known, but it is built only in stationary units.

The Sargent engine is a stationary type, in extensive use for running on natural and artificial gas. Its special feature consists in the closing of the inlet valve at mid-stroke during inspiration, so that during the latter half of the suction stroke the attenuated charge is merely stretched out, so to speak. Consequently, on the return of the piston, compression does not begin until mid-stroke, with the result that during the latter half of the working stroke the charge is worked expansively. Thus an Atkinson-engine effect is gained without the Atkinson complication.

Two-Cycle Engines

Just as one of the great objections to the prevailing four-cycle engine is its complexity, so to the popular type of two-cycle engine can it be objected that it is too simple to function as well as it might. The proof of this is found in the fact that all of the best two-cycle engines confined to marine and stationary use are materially more complicated than the simple valveless two-cycle engines with which the motor car expert is familiar. The classic cross sections of two-cycle engines, familiar to the reader of advertising literature, and in which the incoming and outgoing gases are plausibly pictured by dotted lines and arrows, following courses beautifully determined by systems of ports and deflectors, may appear all right to the layman, but every engineer who has worried with the

EDITOR'S NOTE—This is the fourth of a series of articles on "Some Trends of Modern Automobile Construction" by Victor Lougheed; the fifth and last article will appear shortly.

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design of these motors knows how hollow and meaningless are these simplified expositions of the internal functioning, and what very real difficulties they fail to disclose. The inflexibility of these motors, the incomplete scavenging — especially under throttled conditions—the leakage of charge from the crankcase, the peculiar tendency to four-cycle under certain conditions of light load, and the low efficiency are among the most marked of the many shortcomings.

Nevertheless, the two-cycle principle must appeal to every engineer as fundamentally right, and even in its poorest forms it clearly has advantages that go far to offset its objections. But the road to its improvement is becoming clearly a road away from extreme simplicity. An example of this is the engine illustrated in figure 19, which is a sketch of the well-known Smalley boat engine, in which the valve in the cylinder head is substituted for the usual bypass port. Somewhat similar to this construction is that employed in the Wolverine boat engines, which also have a poppet valve in the cylinder head, and the Truscott motor used to be made with a valve in the head.

Another example of success resulting from the addition of valves and other complication to the two-cycle engine is found in the double-acting, 2,000-horsepower German Korting engine, which is reliable to an extent unknown in the motor car field. And of especial significance in this connection is the previously-mentioned fact that the first engines made by Dugald Clerk, the inventor of the two-cycle principle, were comparatively complicated, having auxiliary cylinders to pump the fuel charges through valves—a system of functioning that is today an essential feature of the Korting engines.

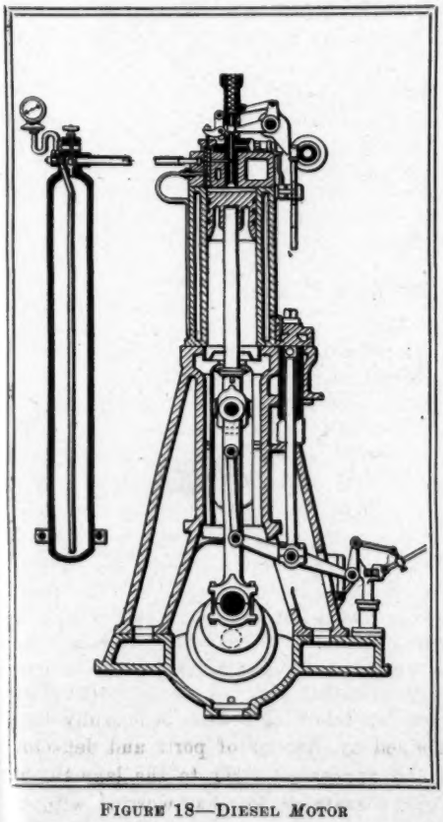


FIGURE 18—DIESEL MOTOR

Expansion Speeds Too Low

It is a fundamental difficulty with most modern internal-combustion engines of approved types that the piston speeds practicable mechanically are too low to expand the charges quickly enough to abstract from them their full content of heat and work. In other words, so much in excess of practicable maximum piston speeds is the rate of flame propagation with average mixtures that a piston moving away from the exploding mixture at the fastest rate possible nevertheless exercises a holding-back effect upon it, with the result that a certain proportion of the heat, instead of being applied to quick expansion and consequent work, is forced into the cylinder walls to cause waste and complication. There is only one obvious remedy for this —reduction of the space occupied by the fuel at the moment of ignition and increase of the space through which it is permitted to expand in a given time. This means high compression and expansive working.

Self-Starting of Motors

As has been pointed out, the only really feasible way of self-starting a liquid-fuel engine is to provide means for positively supplying the cylinders with mixture at any time, not necessarily under compression, but at least capable of being ignited and of producing an impulse. With carbureter-fed engines this is not possible without the provision of complicated auxiliary mechanism—one prominent motor car manufacturer going even so far as to provide a surface carbureter from which vapor may be forced to the cylinders by a hand pump. Another uses a system of feeding an explosive mixture of acetylene gas and air into the cylinders under pressure. Others utilize spring and compressed air cranking mechanisms, by which, as in hand cranking, the engine itself is momentarily worked as a pump for its own charging.

With engine cylinders left full of pure air upon stopping, as in the case of an engine stopped by cutting off fuel injections—a system that is in a manner analogous to the Mercedes method of stopping by shutting off the atomizing nozzle of the carbureter—there is only the fuel component lacking, so there is the certainty that the condition within the cylinders immediately after stopping will not subsequently change of itself, as by condensation and leakage when mixture is retained. Consequently, if fuel be injected at any subsequent time, the cylinders thereupon will contain both of the elements of an ignitable mixture, which, if there is temperature enough for evaporation to occur, mixture is formed in situ, and, if the ignition system is operative, self-starting must ensue. Self-starting by fuel injections therefore presents an evident similarity to the self-starting of a steam engine, in which the first movement also is produced by the direct action of the motive fluid. If there is anything in analogies, this certainly seems to point to separate injection of the fuel as the logical method of starting any multi-cylinder liquid-fuel engine.

Ignition System Improvement

The shortcomings of present ignition systems are so well known as not even to require enumeration. It is sufficient to state that to the ignition system and the carbureter together, despite the great improvements that have been made, still may be ascribed ninety-nine per cent of all the troubles the average user has with the average motor car. Both the jump spark and make-and-break ignition systems of universal approval are complicated, expensive and—even in their best forms—less reliable and foolproof than they should be. With the jump spark system there is the inevitable tendency for the high-tension current to leak and short-circuit, and this tendency cannot be removed, well though it may be guarded against. With the low-tension system, on the other hand, the gain in the one respect is offset by the necessity for a working member through the cylinder wall—a more or less prolific cause of trouble.

Hot-tube systems of ignition—now almost universally discarded — possessed many distinct advantages over the more modern systems of electric ignition, and their use was given up chiefly because of the somewhat dangerous and troublesome open flame their operation involved. And they were further discredited by widely-prevalent ideas about timing that today are coming to be regarded as altogether mistaken. There never was anything to

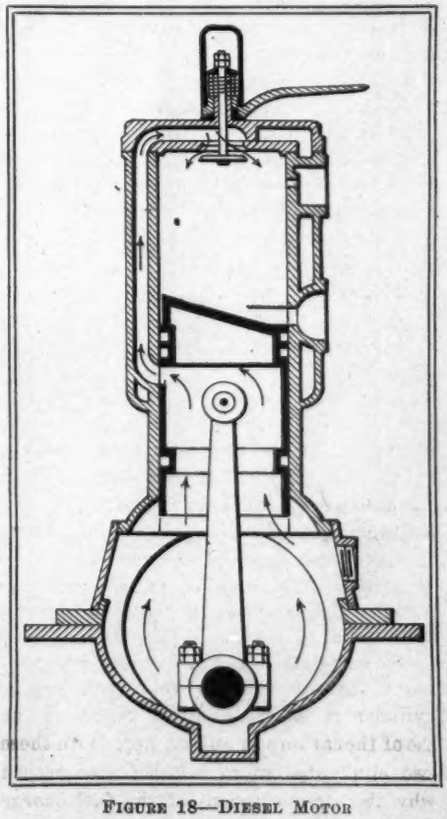


FIGURE 18—DIESEL MOTOR

be said against the reliability of the hot tube, and it is a fact that one of the most successful commercial motor vehicle users in this country today, a large Philadelphia business house, is securing enviable results from a lot of ancient Panhards, all equipped with hot-tube ignition.

Hot-wire ignition is as old as the hot tube, and was found to perform equally well on certain early stationary engines. It is simplicity itself, involving nothing more than a very short and very fine platinum or osmium wire in the cylinder, kept red-hot by the passage of an electric current through it—probably assisted in some slight degree by a measurable catalytic action. It would seem that this system must possess all of the advantages of the hot tube, with none of its disadvantages. The only reason the hot wire ever was given up was that it presented no means of timing the ignition—unless by some complicated provision in the way of a pocketed ignition chamber opened and closed by a shutter. But here is where one radical idea comes to the rescue of another. With a pump system of fuel injection, nothing could be simpler than to time the injections, under which condition ignition certainly cannot occur until there is fuel in the cylinder. Consequently, if a short length of fine wire be continuously maintained at a red heat within the cylinder, ignition will occur at some definite interval after each fuel injection, so if these injections are timed by a spiral feather within the pump cam, or by any similarly simple expedient, the motor can-

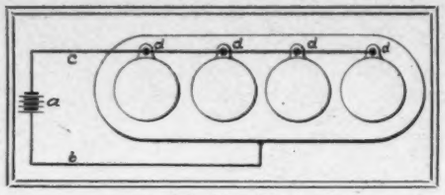


FIGURE 20

not fail to function in a perfect manner.

A brief consideration of this system discloses surprising advantages. First of these is the practically absolute simplicity and reliability. The logical wiring, for instance, for a four-cylinder engine, is diagramed in figure 20, in which it is seen to involve only the source of current a, the ground wire b, the line wire c and the four plugs dddd. These plugs may be rather simpler and cheaper than the types now in use, because neither high-tension insulation nor large size is required.

Through the plugs, which are connected in multiple, the circuit is closed at all times while the engine is running, and the resemblance of the system to one with four miniature incandescent lamps substituted for the plugs is close enough to assure a similar reliability and current consumption. For self-starting, a battery is necessary, but the current can be easily had from a dynamo thereafter. Probably something similar to the Apple system of "floating the battery on the line" would prove about as serviceable as could be desired.

It is to be noted that there is nothing about hot-wire ignition to tax the abilities of the rawest novice—coils, vibrators, commutators, contact breakers, high-tension wiring, moving parts, etc., being absolutely done away with. The only things that can happen are failure of the current and burning out of the plug wires, and both of these can be easily and positively detected by any simple means for connecting a miniature incandescent lamp into the circuit. When detected, they can be as easily corrected. A very vital advantage of the hot-wire system, as used in connection with fuel injections on a self-starting motor, is the assurance it gives of starting in the coldest weather. To insure this, the injections can be directed immediately upon the wire, with the result that the heat of the wire must evaporate enough of the fuel to create an ignitable mixture in the neighborhood of the igniting means.

Ignition timing is an especially objectionable and much-misunderstood requirement of motor car engine operation. Instead of a necessity for producing the actual ignition early or late in the cycle, it really is a complication involving expedient for neutralizing a defect existing in the ignition system itself. It is accepted theory, of course, that because of the time required for combustion to become complete it is essential to satisfactory operation at different speeds that the point of ignition be shifted back and forth in the compression stroke. But the writer never has been able to see that this theory stands analysis, since every properly-made indicator or manograph diagram ever taken from a gas engine definitely supports a contrary opinion. Is it not more probable that with present systems of electric ignition the very measurable lag in the action of the ignition apparatus itself necessitates variations in the moment of commutator contact to prevent variation of the spark moment away from the point at which it should take place?

The manograph diagram reproduced in figure 21 presents from B to C about as slow a rise of pressure as ever is seen on a gas engine card—except when the ignition occurs after dead center. Nevertheless, comparison of the diagram with the cylinder, piston, connecting rod and crank shown beside it discloses the little-realized fact that the pressure, even with ignition occurring at as late as dead center, has skyrocketed to its maximum at C during less than one-twelfth of a revolution—1-20 second at 600 revolutions to the minute—and almost before an effective crank angle and rapid movement of the piston are realized. All this, too, is with a slow rise in pressure, a more usual diagram being that shown at A, figure 22, in which the distance from b to a is traversed in 1-450 second at 1,200 revolutions to the minute. Surely, then, with such enormous rapidity of combustion as all gas engine diagrams and experiments indicate conclusively, there cannot be any great ground for the prevalent belief that ignition must occur in the compression stroke.

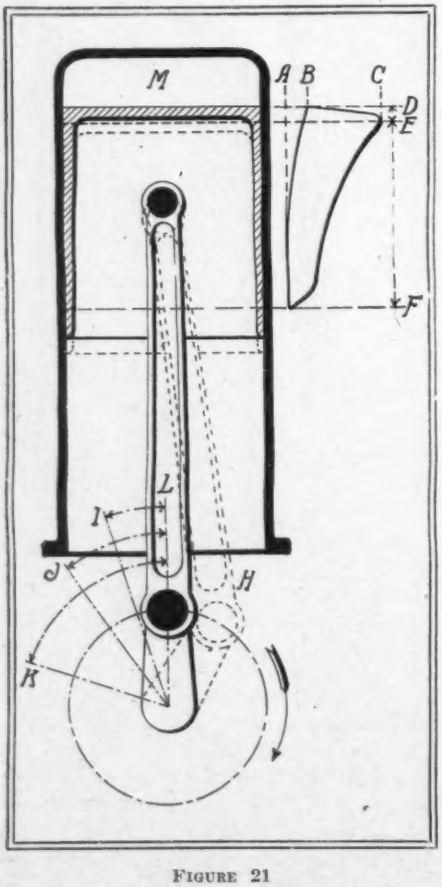


FIGURE 21

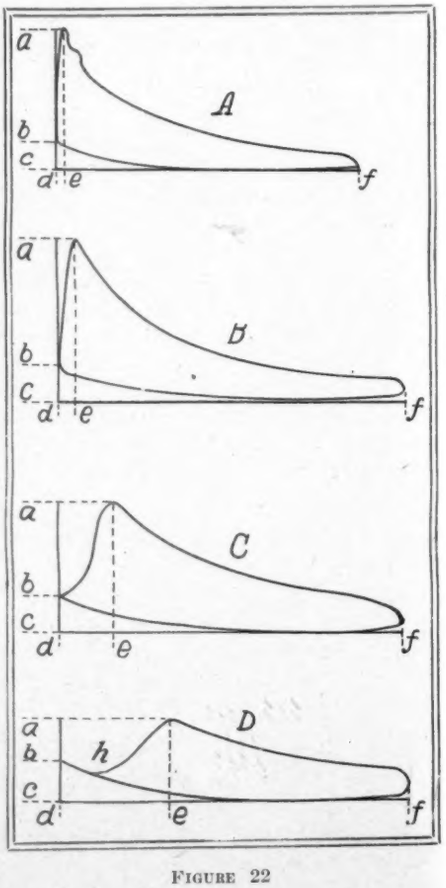


FIGURE 22

To revert again to the matter of lag, let it be assumed that in the case of the engine shown in figure 21 there is a magnetic lag in energizing the coil and a mechanical lag in overcoming the inertia of the trembler blade, which together occasion a lapse of 1-200 second between the instant of commutator contact and the instant of spark occurrence. With the engine running at 1,200 revolutions a minute—1-20 second a revolution—the arc traversed in 1-200 second is that from J to L. Consequently, if commutator contact occur at J, the spark itself will not occur before L—dead center. Now, since these magnetic and mechanical lags always must occupy substantially the same time with the same ignition equipment and current, while the rotational speed will vary widely, at 2,400 revolutions a minute 1-200 second will correspond to the arc KL, and at 600 revolutions a minute it will correspond to the arc IL. Therefore, in varying the speed of the motor from 600 to 2,400 revolutions a minute, it is necessary, solely to maintain the ignition at dead center, to shift the point of commutator contact between K and I.

In other words, it appears evident that only because ignition systems require time to operate is it necessary to shift the instant of commutator contact, which is widely misconstrued as a shift in the instant of ignition—an idea as erroneous as that in favor of the "fat spark," which was so conclusively proved a mere will-o'-the-wisp by the recent experiments of Dr. Watson, in England. In this theory, as has been previously maintained, the writer is upheld by the increasing number of renowned designers who are doing away with the ignition shift on their cars by substituting for it systems that act with less lag. Concerning the "fat spark" theory, so completely discredited by Watson's experiments, the case is simply that the same current that will produce a "fat" spark is strong enough also to produce rapid and positive action of the ignition apparatus throughout, from the source of current to the plug. Thus the advantage of a strong current has been judged by the least important of its effects. Indeed, it may be considered proved that, so long as there is voltage enough to overcome the resistances and amperage enough to energize the apparatus, the "fatness" of the spark matters not at all. The thinnest possible spark is hot enough to ignite gasoline vapor and air, and the difference between it and the "fat" spark, assuming it to be infinitely small and the largest spark to be one-fourth of an inch in diameter, can be no more than the time it takes the combustion to propagate one-eighth of an inch at 3,500 feet a second—a time equal to 1-16,800 of a revolution with an engine running 1,200 revolutions a minute, and by the end of which time the thin spark will have involved a cubic space equivalent to that occupied at the outset by the fat spark, which is thus now shown to be 1-336,000 second quicker!

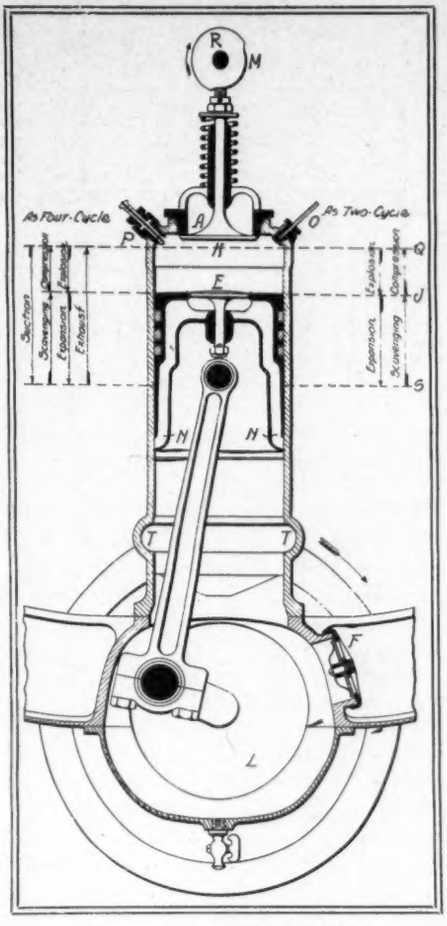


FIGURE 23—LOUGHEED MOTOR

Undoubtedly, under certain conditions a strong spark may help ignition by assisting evaporation and complete mixture of the fuel elements. But the use of the ignition means for this purpose should be scarcely necessary if carbureters were as good as is thought. Also, the powerful, disruptive discharge that comes from the strong current of high voltage, has a marked effect in lowering the resistance of the compressed gases adjoining it, by a sort of wireless-telegraph action similar to that of the Hertzian waves on a coherer. This phenomena very likely accounts for the fact that some engines, equipped with double sets of ignition, work better when both systems are switched in than they will with either alone, one discharge helping the other. Possibly, too, in this may be found much of the virtue of the once popular spark gap, which actually gives better results when placed close to the cylinders than when farther away. In line with this was the idea of a French inventor, who proposed the use of static-discharges outside the cylinders in order to reduce the resistance within them.

A common experience, proving the existence of the very measurable lags that the writer contends must exist in ignition apparatus, is found in the mysterious alteration in the ignition timing that goes on with many cheap cars. In these, usually fitted with dry batteries and cheap coils, as the battery runs down the contact maker and coil require readjustment from time to time to maintain the ignition far enough ahead. Then a new set of cells is bought, and the ignition is thereupon found to be so advanced that a dangerous back kick can ensue. Another curiosity of present ignition apparatus is the theory that the vibrator or trembler is advantageous because it produces a "rapid succession of sparks" in the cylinder, thus adding to the assurance of ignition. The writer never has seen a vibrator that could be made to work faster than 1-200 of a second, and most, under average conditions, work much slower than this. Yet even 1-200 of a second is time enough for an engine running at 1,000 revolutions a minute to turn through an arc of 30 degrees, so the question might be asked—what good does the second spark do if the first fails to produce ignition?

With all of the diagrams shown in figure 22, ignition is assumed to occur at dead center or after. Its occurrence before dead center always is disclosed by a rise in the compression line from c to b much more abrupt than the hyperbolic curve that signifies compression and heat of compression alone. In a diagram like that illustrated at C, the slow rise can be usually attributed to an enormous retention of exhaust gases, unless, as in the case shown at D, it is definitely due to delay of the ignition to h. In a diagram of this type, a failure of the line to go back exactly upon itself does not necessarily indicate ignition, since there may be a slight rise due to absorption of heat during the prolonged contact with the hot cylinder wall.

The most serious objection to provision for ignition timing is that it undoubtedly traps many, even among good drivers, into working their engines inefficiently by placing the lever too far forward. Nothing could be more absurd, for instance, than the common assumption that if ignition is too far advanced the motor will pound, and that to insure good results it suffices to keep the spark lever just back of the pounding point. Take a simple hypothetical case in point. Conceive a single-cylinder motor, capable of developing 10 horsepower, and assume that the spark is so far advanced that in each compression stroke there is a back impulse equal to four-tenths of the power output of the motor, followed in each working stroke by an impulse equal to six-tenths of the power output. The smaller of these components tends to reverse the motor, while the greater tends to maintain the normal direction of rotation, so a simple subtraction

EDITOR'S NOTE—In part II of this series, published June 28, the caption to the illustration on page 19 should have read "A Simple Distributor," instead of "New Design Pump;" and in the issue of July 11, the thirty-third line in the third column on page 16 should have read "and it was found unnecessary to use;" the first line of the next to the last paragraph on page 18 should have read "However, it fortunately does not."

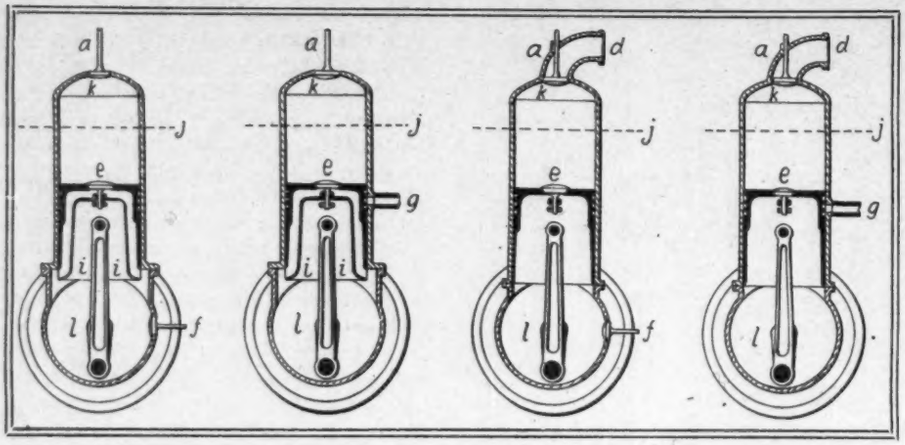


FIGURE 24 FIGURE 25 FIGURE 26 FIGURE 27

shows that only 2 horsepower out of the 10 developed are actually available, the other 8 being divided into two equal components that neutralize each other. Now, then, if the power demand is such —because of good road surface, easy gradient, or light load—that 2 horsepower suffices to propel the car, what is to disclose the waste that is going on?

Certainly there is nothing to make the engine pound, unless the opposed impulses so nearly balance as almost to stall the motor. All the pressures remain in one direction, even though the motor is working against itself—compressing the explosions, so to speak—and unless there are bearings so loose that they would produce a knock in almost any circumstances of hard running, the engine should run silently. From all of which it seems a reasonable conclusion not only may ignition advance be unnecessary, but that it easily may become a most positive detriment, even with fairly expert operation. And when it is considered that the combustion of the gases within the cylinder is pressure-creating rather than pressure-maintaining, and that the heat, which alone holds up the pressure, passes rapidly into the cylinder walls during every thousandth of a second in which its free and rapid expansion is delayed, it must become very clear that such a thing as necessity for ignition advance is theory outside the cylinder rather than a fact within it.

Reversing Engines

With the possibility that motor car engines of the future may be four-cycle, with a common exhaust-and-inlet valve, or two-cycle of some modified form, the writer believes that there is much reason to expect the reversing gear to be done away with in the near future. And that this will be a most desirable step in the direction of the long-heralded gearless car, no one can dispute. The means now adopted for reversing small two-cycle engines, by letting them slow down and then advancing the spark suddenly in the reverse direction, and the methods of reversing large four-cycle engines by the use of tanks of compressed air, or by duplicate valve-operating gear, are either unreliable or objectionably complicated. And the absence of self-starting, necessary to start in either direction, detracts greatly from their utility.

Some Examples of Improved Functioning

The several constructions next to be described are made practicable only by the use of the pump system of fuel injection, applied in connection with the system of control by fuel-throttling alone—the air volumes being invariable. The advantages it is thought to combine will appear from the descriptions, it being only necessary to say here that the apparently novel ideas advanced are in no case either new or untried, or of doubtful value—the novelty consisting solely of new combinations of well-known elements. The Lougheed cycle, recently patented by the writer, is probably most interesting from motor standpoints in the form shown in figure 23.

As a four-cycle engine the motor functions as indicated by the series of arrows at the left. During the suction stroke pure air is inspired directly through the valve A, which is mechanically opened by the cam M. Inspiration is continued to the bottom of the stroke S, at which point the piston ports NN come into registry with TT and thence into communication with the crank chamber L, whereupon another volume of pure air, previously inspired through the valve F and compressed within L, is sent through the piston and into the cylinder by way of the light clack valve E, which is clacked back and forth solely by alternation of pressures, it being provided with neither spring nor gear.

The contour of the cam M is such that the valve A does not close at the end of the suction stroke, but remains open until the piston has risen to the dotted line J—two-thirds of its travel on what in the ordinary type of engine would be the compression stroke. The consequence is that the major portion of the double cylinderful of air taken in through A and E is immediately scavenged out again through A. When the piston reaches J, the valve A closes and compression begins, fuel meantime being injected under high pressure through the minute nozzle at O. The compression space K—from the line Q to the top of the cylinder—is made comparatively small in proportion to the space above J, so that the compression will rise to a probable pressure of 125 pounds to the square inch, with a corresponding temperature of 600 or 700 degrees Fahrenheit. Ignition is effected by the hot wire—or by jump spark or make-and-break—at P, immediately subsequent to the injection, and the explosion stroke thereupon commences. Down to the line J this stroke is analogous to the similar stroke of an ordinary motor, during which the piston sweeps a cylinder equal to that swept during compression.

From the line J down to the line S, however, a new condition supervenes. At J the charge has reached its original volume, occupied at the moment compression commenced, so the travel from J to S affords expansive working, with the result of bringing the pressure almost down to atmosphere, with corresponding reduction of the heat. At the end of the expansion stroke, the valve A is again mechanically opened, and the burnt charge commences to escape through it directly into the air at about the same moment the piston ports NN recommunicate with the crank chamber. The result is the instant rush of a scavenging blast of cold air through the piston and through E, forcing the exit of the exhaust through A. And, as the piston continues to rise, the layer of pure air now above it, assisted by the comparatively small compression space, insures the expulsion of every vestige of exhaust—if this

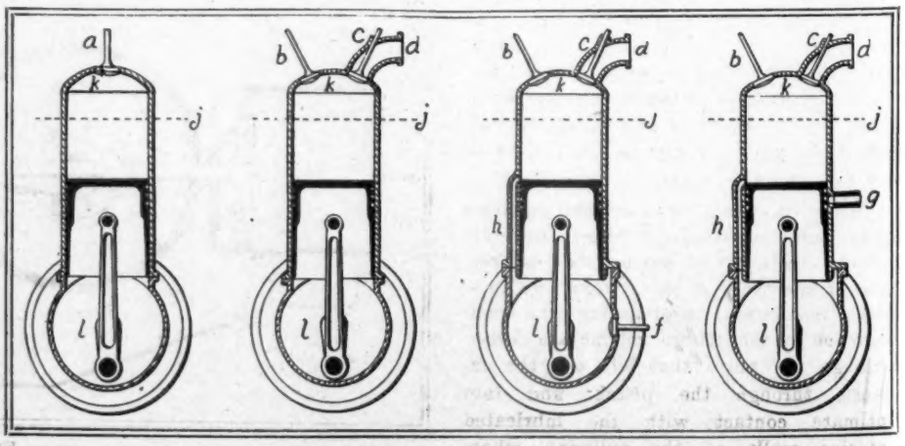


FIGURE 28 FIGURE 29 FIGURE 30 FIGURE 31

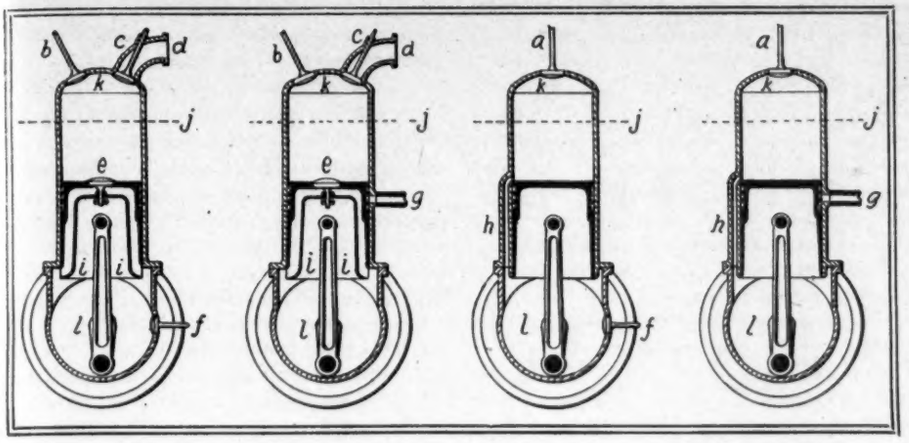


FIGURE 32 FIGURE 33 FIGURE 34 FIGURE 35

were not already sufficiently insured by the aspiration of the excess air during the suction stroke and the subsequent expulsion of the most of it during the scavenging-compression stroke.

No muffler is required because the terminal pressure is carried so low that the direct escape of the exhaust into a current of air kept flowing through the bonnet will not make any more noise than that present at the usual muffler vent, from which the waste gases ordinarily escape at fully as high pressure. Internal conditions so far are much the same as in Clerk's famous experimental engine, already referred to. The combustion space is absolutely scavenged by the large amounts of air, while the addition of fuel on the compression stroke increases the charge weight and provides for supercompression. The result, therefore, must be similar flame temperatures and efficiency. We have Daimler's word for it that "scavenging is a chief source of success and small fuel consumption." It is, however, when to the foregoing is added the principle of expanding the charge, that the new cycle commences to show extraordinary advantages. As the piston nears the end of the compression stroke the trapped air is compressed into the small clearance and the temperature of the surrounding metal is raised exactly as in a Corliss engine. The cylinder thus approximates the condition in the high-pressure cylinder of a multi-expansion steam engine, using superheated steam or steam-jacketed walls, and in which every effort is made to limit the temperature range—500 to 600 degrees Fahrenheit being found most desirable. This is probably just about the wall temperature that would be realized with the new engine.

Cooling is shown by a detailed analysis to be amply provided for within the functioning itself, since, during each completion of the cycle of four strokes, volumes of air theoretically aggregating nine times as much as the charge volume are forced through the valve that lets out the exhaust, through the piston, and into intimate contact with the lubricated interior walls of the cylinder, where cooling is most needed. Practically, this amount is reduced slightly by various factors, but not enough to detract perceptibly from the general result, which is maintained approximately at all speeds and under all conditions. Beginning with the suction stroke, a cylinderful of cold air—the equivalent of what three cylinderfuls would be in the ordinary engine, if the relation of charge space to full cylinder volume be taken into account—is inspired through the valve A. At the termination of this stroke a similar volume comes in from the crank chamber through the piston and the valve E. Still another volume comes in similarly at the end of the explosion stroke.

Dividing this total of air into nine equal parts, each equal to a charge volume, it is found that six parts pass once through the crank chamber, the piston, the cylinder, and the upper valve, while two parts pass twice through the upper valve and the cylinder and one part passes once through the upper valve and into the cylinder, where it remains to form the charge. The Frayer-Miller engine, which is air-cooled by the forcing of considerable volumes of air through an air jacket, affords some significant data here. In the 24-horsepower model, in which the bore is $4\frac{1}{16}$ inches and the stroke $5\frac{1}{8}$ inches at 1,200 revolutions per minute the air blower the cylinders. This is 12½ cubic feet, or forces 50 cubic feet of air a minute over 21,600 cubic inches, per cylinder per minute. And, since in 1,200 revolutions the cycle of operation is completed 600 times, it follows that 21,600÷600—36 cubic inches—is forced into contact with the outside of the cylinder during the completion of the cycle. Compare this with the volume of the cylinder, which is 66.43 cubic inches—with a volume swept by the piston of only 49.82 cubic inches—and it becomes evident that the cooling is produced by an external air volume certainly not more than one-third greater than the charge volume—if it be assumed that wire-drawing, heating, and other effects keep out no more than one-half of the 49.82 cubic inches. This is against an internal cooling volume of nine times the charge volume, in an engine that functions cooler.

In view of all this, it requires only a consideration of the other features of the cycle to bring realization that any provision for external cooling would be so unnecessary as to be absurd. As has been pointed out, in the conditions established the flame temperature can be expected to range from 2,100 to 400 degrees Fahrenheit. Moreover, the fuel being injected as a liquid, it must abstract heat from the air as it passes into the gaseous state, and the compression stroke works with a lower temperature because it compresses cold air, instead of a mixture heated by drawing in past hot walls and valves, and by mixing with at least 25 per cent of its bulk of hot residual gases left in the clearance.

Supplementing all the other factors that make for cooling, there is the time element to be considered—this being a material factor in retarding the heat flow. The new cycle handles a charge ranging from 2,100 to 400 degrees Fahrenheit in the same time as is required by the ordinary motor car engine for a temperature range from 3,000 to 1,400 degrees Fahrenheit. Or, to put it in another way, while the ordinary engine handles its charge from 3,000 to 1,400 degrees Fahrenheit in one unit of time, the new engine handles its charge from 2,100 degrees Fahrenheit to probably 1,000 degrees Fahrenheit in about one-third of the time. Thus, in the new cycle it can be considered that the charges are expanded at three times the speed now

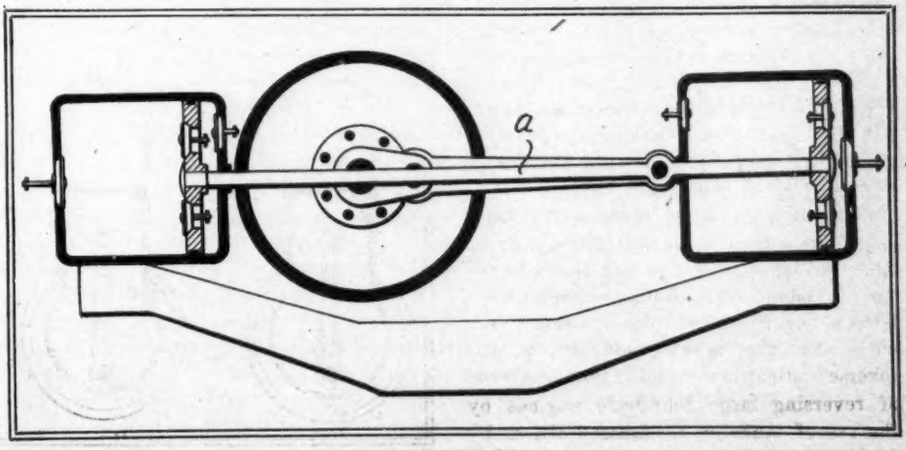


FIGURE 36

usual, the piston speed being the same.

The inevitable result must be less heat waste to cylinder walls. And it is natural to conclude from this that if less heat is thus wasted, and expansion is carried lower than is possible with other systems, and the effects of scavenging and supercompression are added, all these must combine not only to insure cool working, but also to produce a higher thermal value and a greater mechanical efficiency.

In the engine illustrated in figure 23, a capacity of 24.91 cubic inches—one-half of 49.82—from J to Q is absolute assurance of an equivalent charge volume, since by the plan of inspiring an excess of air most of which is scavenged out again, wire-drawing is avoided and compression always must commence at slightly above atmospheric pressure. Consequently, the volume swept by the piston below J being twice that swept above it—24.91+49.82—plus probably 4 cubic inches for compression space, gives a cylinder volume of 79 cubic inches—against the Frayer-Miller cylinder volume of 66.43 cubic inches—theoretically necessary for the handling of a given charge volume. And since the actual figures probably are even more favorable than this indicates, as is suggested in figure 1, in the first article of this series, while at the same time the given charge is utilized more efficiently, it is clear that size for size the new cycle should give considerably the greater power, if more efficient handling of more fuel has anything to do with results.

Control is effected by varying the amount of fuel injected for each stroke, without any attempt to reduce the air component of the mixture in proportion. The Diesel engines, the Antoinette engines, and 30,000 American marine and stationary engines, pump-fed with kerosene and gasoline, prove that with sufficient compression and proper ignition lean mixtures can be used with an efficiency and satisfaction not dreamed of by the mixture theorists who have short-sightedly confined their investigations of explosive mixtures to the action of these at atmospheric pressures. The only possible objection to lean mixture is that it is a little harder to ignite, and that it will not stand the presence of much exhaust gas as a diluent. The advantage of not varying the air volume is that it preserves the proper degree of compression at all speeds under all loads. The natural result is a thermal and working efficiency far higher than is by any possibility to be had with the mixture-fed, throttle-strangled and muffler-choked motor car engines of common practice.

Apparent objections, though they may seem to exist, upon detailed examination for the most part disappear. For instance, it is to be observed that the pumping function of the crankcase can by no possibility cause trouble through leakage, or through any untoward effect upon the lubricant, as is so likely to be the case with the ordinary two-cycle engine. The fact that excess quantities of pure air are handled means that considerable leakage can take place without occasioning any fuel loss or materially deranging the functioning, while, of course, it is the gasoline vapor in the crankcase of the ordinary two-cycle engine that cuts the lubricant. With either the two-cycle or four-cycle working, if the engine is throttled so low that by any chance the pressure within the cylinder tends to go below atmosphere before the termination of the stroke, no work is wasted, the valve A simply acting as an automatic inlet valve and permitting the entry of sufficient air to relieve the vacuum. This, incidentally, helps the cooling. The production cost is lowered in that the cylinder is a light and simple casting, with the difficult coring necessary to form waterjackets avoided. Since the interior cooling action is positive, and does not depend upon pumps or

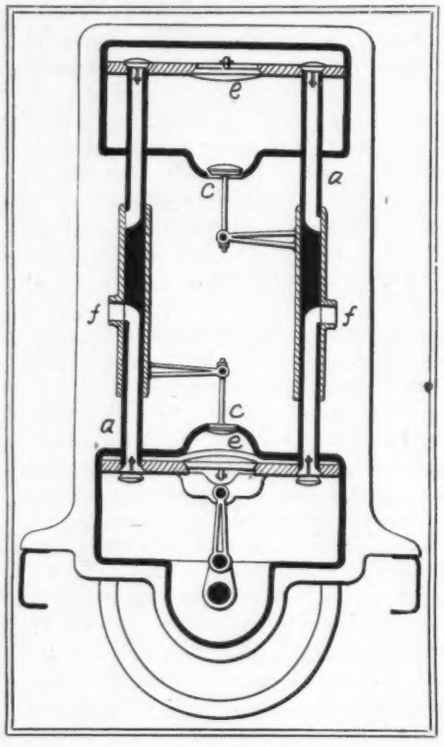


FIGURE 37

fans, it is automatic and sure, and there being no water the danger of burst cylinders from freezing is eliminated.

As a two-cycle engine the new motor functions quite as well as it four-cycles, except that in so operating a proportion of the internal cooling effect is lost. The system of operation as a two-cycle engine is suggested by the arrows to the right of figure 23. Commencing with the explosion stroke, the piston starts under the same conditions as prevail in the four-cycle, the original charge volume being based upon the space above J, and the charge being worked expansively as the piston descends below this line. When the end of the stroke is reached, the valve A, which now serves solely as an exhaust valve, is mechanically opened and the piston ports NN at the same time establish the communication through the piston with the crank chamber. This permits the crank chamber air to rush in and assist the rising piston to scavenge the burned charge out ahead of it, so that by the time the line J is reached practically pure air fills the remaining space in the cylinder. By this time A closes, compression commences, and the fuel injection carburets the charge. Ignition then takes place and the cycle repeats itself indefinitely.

Two-to-one gears are unnecessary for the new engine when worked exclusively as a two-cycle, though the cams and valve gear, of course, are required, being run directly off the crankshaft. In either case the arrangement and construction admits of practically the same latitude in design that is allowable with current types of engines. The only difference is that the valve gear may be considerably lighter, and will be less subject to wear, since it opens valves against very low pressure. Flexibility is assured by the inspiration of the excess air and the subsequent expulsion of most of it, so that at the commencement of compression the space through which the piston still has to travel is occupied by air slightly above atmospheric pressure, without regard to the speed at which the engine is running, except that higher speed must increase the pressure at least slightly. In this way there is secured a materially greater torque range than is common to other four-cycle engines, in which slow expansion at low speeds and wire-drawing at high speeds reduce the power output per stroke very materially at the ends of the rotational range.

Economy much greater than is now secured must result from better temperature of the cylinder walls, the injection of the fuel from a closed hydraulic system directly into the cylinder while all valves are closed, the constant high compression even under light loads, the rapidity of expansion, the expansion to a low terminal pressure, the elimination of burned gases from the clearance, and the avoidance of negative work, such as is involved in the running of pumps, the mechanical opening of valves against high pressures, etc. Other benefits appear that can be present in no other engine. In the first place, because of the fuel-injection system, pure air alone being compressed, there is no chance of preignition.

Very high compression, if employed, cannot involve the heavy flywheel that is a chief objection to such engines as the Diesel, and which prevents their use for motor car service. This is because, as shown in figure 23, compression commences when the crank and connecting rod are well past the positions of greatest angularity, so that as the compression rises its retarding effect can be only ineffectively exerted through a rapidly closing toggle-joint. Though in figure 23 hot-wire ignition is shown, and self-starting is planned

to follow from the system of fuel injection, which the hot wire aids by vaporizing the liquid in cold weather, there is, nevertheless, no reason why any approved method of ignition could not be used. There is nothing inherent in the cycle to compel the use of one system more than another. Reversing can be effected as easily as self-starting, nothing more than a rotation of the camshaft, 180 degrees being required to effect it.

The advantages offered by the new engine are startling when summarized. Its successful application will eliminate the carbureter, the intake piping, one mechanically-actuated valve, all reversing gears, the cooling system, the muffler, the exhaust piping, the starting crank, the ignition coil, the commutator, all vibrators and make-and-break devices, and the high-tension insulation. And to these are added absolute self-starting and reversing, elimination of preignition, positive fuel compounding, capacity to use all fuels that can be used in any internal combustion engine, higher efficiency—thermal and mechanical—lowered cost, because of less expensive and better castings, no fuel waste, no possibility of freezing, small size and light weight, simplified control and maintenance, improved flexibility, and reduced valve-gear wear, because valves open against low pressure.

Modifications of several obvious variant forms are possible with this new cycle, and several of these might conceivably assume importance for certain purposes. Twelve of the principal modifications are sketched in figures 24 to 35, inclusive. The first of these, shown in figure 24, is the simplest possible form, it consisting of nothing but the plain cylinder and piston, with a single mechanically-actuated valve. Air is inspired through the valve a, during the suction stroke, and during the scavenging-compression stroke two-thirds of this air is blown out again through a. At j compression commences, accompanied by the fuel injection, and the functioning proceeds as in the engine illustrated in figure 23, except that the crank chamber is not used to supply additional volumes of air to intensify cooling and scavenging. The engine shown by figure 25 is the same as the one shown in figure 24, except that two valves are used—an inlet valve b and an exhaust valve c. This permits the addition of exhaust piping at d, so that the engine can be used for stationary service, in conditions that would make objectionable the free discharge of the exhaust, even noiselessly, in the neighborhood of the engine.

The engine shown in figure 26 bears a still closer resemblance to figure 25, except that it also is a stationary engine, provided with two valves in the head for the purpose explained in the preceding paragraph. The clack valve in the piston is rejected in favor of the bypass h, which is simpler and serves equally well, except that it does not cool the piston. The engine shown in figure 27 is similar to that shown in figure 26, but it is modeled more on the plan of a three-port two-cycle engine, with the intake port g in place of the valve f in figure 26. This makes it clear that the new cycle need not necessarily involve valves in piston or in crankcase. The engine shown in figure 28 is a duplicate of that shown in figure 23, except that the two valves are provided in the head, to adapt it to stationary service, in which more care may be necessary in disposing of the exhaust gases. The engine shown in figure 29 differs from that in figure 28 only in that the intake port g is used instead of the crankcase-valve f. All of the six engines so far described are designed for four-cycle working. The next four, as in the case of the engine shown in figure 23, can be worked either four-cycle or two-cycle without changing anything but the cam contour and the frequency of fuel injections.

The engine shown in figure 30 is the same as that shown in figure 26, except for its having only a single valve in the head. The engine shown in figure 31 is the same as that in figure 30, except that in it the crankcase valve f is displaced by the intake port g. Figure 32 shows the same engine that is the subject of figure 23, included simply to make the group complete. The engine shown in figure 33 is nearly the same as the preceding—the intake port g being substituted for the valve f.

The engines shown in figures 34 and 35, respectively, which differ from each other only in the use of the valve f or the port g, as the case may be, are both two-cycle engines, and, since in these the valve a always is an exhaust valve, the exhaust piping d can be permanently affixed. Moreover, inasmuch as every stroke is a power stroke, the piston port made by the lining ii is unnecessary, there being no suction stroke during which the air would pass from the crank chamber to the cylinder prematurely. It is to be noted that the engine shown in figure 34 differs from the one shown in figures 23 and 32 only in the elimination of the piston port.

There is less objection to a clack valve in the piston than might be imagined, valves having been used with success in the pistons of the earliest Daimler engines, as well as in many others engines since then. And in at least one case of which the writer knows—in the department of parks, of New York city—a V-shaped Daimler engine with piston valves still is running and giving good service.

Freak modifications, along lines that are at least interesting, are possible with the new engine. For instance, it will be noted that the forms illustrated in figures 24, 25, 26, 28, 30, 32 and 34 can be used with disk pistons and crossheads, should any special requirements make this construction seem expedient. Used in this way, the underside of the piston can be made into a pumping chamber and use of the crankcase for this purpose thus avoided. In fact, with disk pistons, the new cycle would even lend itself to the design of oscillating engines—heretofore unheard of in gas-engine practice.

Another freak line of development, possessed nevertheless of some slight promise, is suggested by the engines illustrated in figures 36 and 37. The first of these, that shown in figure 36, is practically a tandem construction, composed of two two-cycle engines of the type illustrated in figure 34—except that disk pistons are used—mounted on the ends of the common piston rod a. The operation being two-cycle, it follows that every stroke of the complete mechanism, in either direction, is a power stroke. This renders mechanical balance of any kind totally unnecessary, the reciprocating parts being shuttled to and fro by an alternation of pressures that perfectly cushions the ends of the movement. A single connecting rod is used, of the form shown in the illustration, or the Scotch yoke construction, common on fire engines, can be used. The arrangement shown, however, does away with the crosshead and permits use of a single-throw crankshaft. At the same time there is secured as maintained a torque as is had with present four-cylinder engines, which also have practically single-throw cranks, inasmuch as all of the cranks are in the same plane.

The engine illustrated in figure 37 is in a fashion similar to the preceding, but in this case the two disk pistons are connected by the hollow tie rods aa, which pass through the combustion chambers. With both pistons at the top of the stroke, as shown in the sketch, there is a volume of pure air compressed above the upper piston, while an uncompressed volume of air has been just inspired beneath the lower piston, through the hollow tie rods and the ports ff in them. The valve c is mechanically opened, so that the burnt gases in the upper cylinder are ready to exhaust, and the valve d is closed, ready for explosion to commence. Because of the relieving of the pressure within the upper cylinder by the opening of c, the charge of air compressed above the piston will pass through the clack valves ee in the piston, and into the combustion chamber. The fuel component is supplied by pump injection, and the method of inspiring an excess of air and blowing out the major portion of it, as previously described, is employed.

Stratification of the charge is produced to an extent by the fact that the fuel is injected into the compression space f, above the center of the piston, so that in the annular zone around its outer edges, and through which the tie rods pass, there is almost certain to be nothing but pure air. If this effect can be practically realized as well as it appears in theory, it would go far to prevent any possible trouble from overheating of the tie rods, which also have cold air working through them.

NEW CLASSIFICATION RULE IS PLANNED

NEW YORK, Aug. 19—The trades and contests committee of the Importers' Automobile Salon, Percy Owen, Paul La Croix, Gaston Rheims and George MacWilliams, has completed its report on its idea of the way contests should be run and has submitted it to the A. L. A. M., the A. M. C. M. A., the Automobile Club of America and the Importers' Salon. In brief, the committee believes in using horsepower classification and suggests that the English system be adopted. The recommendations of the committee as announced today are as follows:

"The committee formally recommends the discouragement of events exclusively for either foreign cars or for American cars as not tending to bring out the comparative merits of the two, nor fair to either one nor to the public, and recommends that such events be not supported by entries of any imported cars.

"Judges, committees or other officials directly in charge of all contests, and especially such committees as formulate the basis upon which such events shall be run, should be selected from motor or mechanical engineers whose standing is recognized by the industry and community, and whose knowledge and interest in the welfare and progress of the industry will be paramount. That such judges, committees or bodies in charge should include representatives of recognized repute from each and all of the prominent associations known to have the interests of the industry at heart. These in the mind of your committee would be representatives of the Association of Licensed Automobile Manufacturers, the American Motor Car Manufacturers' Association, the Automobile Club of America and the Importers' Automobile Salon.

"Each of these associations should appoint from its membership a trades and contests committee similar to our own; a representative of each of these committees conveying the opinions and ideas of their representative committees should jointly revise the merit determining basis or standards which are in use today, and

Importers' Committee Wants Contests Conducted on New Lines—Thinks the A. A. A. Is Backward

which are recognized as sometimes partial, discriminating and unreliable.

"Until such a desirable state of affairs can be brought about, your committee recommends as the most fair, the most complete, scientific and generally recognized foundation of all merit, the true horsepower classification, and that pending further national or international action in the matter, the generally conceded fair average horsepower formula adopted by the Royal Automobile Club of Great Britain and Ireland for determining horsepower for contest purposes be accepted by the importers in classifying for the purpose of same, and further until the aforementioned and hoped-for nationally or internationally accepted basis becomes a fact, the following classification be urged by importers for use in such contests and by such associations as will use them: Class A, beginning with 60 horsepower and over; class B, beginning with 50 horsepower to, but not including, 60 horsepower; class C, beginning with 40 horsepower to, but not including, 50 horsepower; class D, 30 horsepower to, but not including, 40 horsepower; class E, 20 horsepower to, but not including, 30 horsepower; class F, 10 horsepower to, but not including, 20 horsepower; class G, under 10 horsepower."

The accompanying table was prepared by Worby Beaumont. In working it out the bore of the motor is taken from the marginal or left-hand column, following directly across to the column whose heading in fraction of inches or millimeters added to the bore gives the stroke. The figure at the intersection of this column and the bore column gives the horsepower of one cylinder of that size at 750 revolutions, and the figure immediately below gives the horsepower at 1,000 revolutions, which is generally accepted for computing present-day high-powered motors. The power given in the table represents the calculated indicated power given by one cylinder, and for multi-cylinder engines the power shown must be multiplied by the number of cylinders. The usual formula for calculating horsepower has been used in this table, viz.:

$$\frac{\text{PLAN}}{33{,}000\times 2}$$

P means effective pressure of 90 pounds per square inch, L stroke of engine in feet, A area of piston, N revolutions per minute. Mr. Beaumont's table is attached to the report and it is recommended that it be used until this or some other formula be accepted jointly by other associations which are requested to co-operate.

MAKES BOSTON SMILE

Boston, Mass., Aug. 20—Massachusetts motorists are smiling at the statements emanating from New York during the past few days to the effect that the next A. A. A. or Glidden tour would be over the fine roads of New England up to the mountains of New Hampshire. In the first place, the talk of such a tour is premature, the Bay state men believe. In the statements sent out they see in it a plan to make the clubs in New England get up and shout for joy for the A. A. A. and fall over themselves to get into the fold. New England has been growing wonderfully as a motoring field of late. New clubs have been springing up here and there in each state. But some of the clubs have not manifested any great desire to join the A. A. A. for they are headed by business men who want to know what they are going to get in return for what they give. The old spirit of "no taxation without representation" that was responsible for the revolution and liberty for this country still has its being in the blood of the people of this section. That being so, the tendency is more apt to be to break away from the parent organization. More than one motorist here forsees the beginning of the A. A. A. end.

WORBY BEAUMONT'S TABLE FOR DETERMINING HORSEPOWER, FAVORED BY THE IMPORTERS

Bore in.	0	¼	½	¾	1	¼	½	¾	2
2	0.54	0.60	0.67	0.74	0.81	0.88	0.94	1.01	1.08
	0.72	0.80	0.89	0.98	1.08	1.17	1.25	1.35	1.44
2¼	0.76	0.84	0.92	1.01	1.09	1.18	1.26	1.35	1.43
	1.01	1.12	1.22	1.34	1.45	1.57	1.68	1.81	1.90
2½	1.04	1.15	1.25	1.35	1.46	1.56	1.67	1.77	1.88
	1.39	1.53	1.67	1.81	1.95	2.09	2.23	2.37	2.51
2¾	1.39	1.51	1.64	1.77	1.89	2.02	2.14	2.27	2.40
	1.85	2.02	2.19	2.36	2.53	2.70	2.87	3.04	3.20
3	1.80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	3.00
	2.40	2.60	2.80	3.00	3.21	3.40	3.61	3.81	4.00
3¼	2.30	2.47	2.65	2.82	3.00	3.18	3.36	3.53	3.70
	3.06	3.28	3.52	3.76	3.99	4.22	4.45	4.70	4.92
3½	2.86	3.06	3.27	3.48	3.68	3.88	4.09	4.30	4.50
	3.81	4.09	4.36	4.63	4.90	5.18	5.45	5.72	6.00
3¾	3.53	3.76	4.00	4.35	4.47	4.71	4.95	5.18	5.41
	4.71	5.02	5.34	5.65	5.97	6.28	6.60	6.91	7.23
4	4.27	4.65	4.81	5.08	5.35	5.61	5.89	6.15	6.41
	5.71	6.06	6.42	6.78	7.13	7.50	7.85	8.20	8.55

Bore in.	0	¼	½	¾	1	¼	½	¾	2
4¼	5.13	5.44	5.74	6.04	6.34	6.64	6.95	7.25	7.55
	6.84	7.24	7.64	8.05	8.45	8.85	9.25	9.66	10.06
4½	6.19	6.53	6.87	7.22	7.56	7.90	8.25	8.59	8.93
	8.25	8.68	9.16	9.62	10.08	10.54	10.96	11.41	11.89
4¾	7.18	7.55	7.94	8.31	8.70	9.07	9.45	9.82	....
	9.57	10.07	10.57	11.09	11.58	12.08	12.59	13.09	....
5	8.38	8.80	9.22	9.65	10.05	10.46	10.90	....	....
	11.16	11.72	12.28	12.84	13.40	13.95	14.50	....	....
5¼	9.70	10.16	10.62	11.09	11.54	12.00	....	....	....
	12.02	13.54	14.15	14.76	15.40	16.00	....	....	....
5½	11.12	11.65	12.15	12.66	13.15	....	....	....	....
	14.84	15.51	16.20	16.86	17.54	....	....	....	....
5¾	12.71	13.27	13.82	14.38	....	....	....	....	....
	16.96	17.70	18.42	19.19	....	....	....	....	....
6	14.45	15.05	15.65	....	....	....	....	....	....
	19.25	20.05	20.85	....	....	....	....	....	....

LEGAL LIGHTS AND SIDE LIGHTS

FIND POLITENESS PAYS

A new scheme has been adopted by the Middleboro Automobile Club, of Middleboro, Mass., to stop overspeeding. So far it has met with good results, showing that politeness pays. It seems the local officers had set some traps and were indiscriminately arresting people passing to and from Boston to points on the south shore of Massachusetts. They were fined and some of the citizens sought to spoil the trap by warning motorists, an action that led to a severe lecture from the judge of the local court. So the Middleboro club took the matter up and the plan adopted by it has received the sanction of the selectmen. The motorists have men stationed on the roads entering the town and these men pass out to all tourists a card reading as follows: "To Motor Car Owners and Drivers—The selectmen of Middleboro are going to stop fast driving through this town. Before resorting to several permanent traps, they have kindly given the Middleboro Automobile Club permission to try and regulate this traffic. Won't you personally help us when going through by running not faster than 12 miles per hour? You can go through the town at 12 miles an hour in 5 minutes; if you go fast you cannot go in less then 2½ minutes. Will you not do your part in helping us to make traps unnecessary in Middleboro? Show this card to your friends." The word has been passed along by the motorists and now they go through there without exceeding the speed limits. So the vexed question seems to have been settled without friction.

FAVOR TRUAX RULING

The recent decision of Justice Truax of the supreme court, sitting in New York city, which places all cases of alleged speeding under the local ordinance which provides for a fine of not more than $10, seems to have aroused a great deal of interest. Some of the motorphobe papers which have been crying loudly for jail sentences and large fines seem much perturbed over the reasonable penalties which are to be inflicted on drivers who forget they have low speeds on their cars. It appears probable that the board of aldermen will pass new regulations to conform with Justice Truax's decision. Anticipating this fact, DeWitt C. Morrell, the acting chairman of the law committee of the New York Automobile Club, has written a letter requesting that representatives of the club and of the industry generally in New York city, be given the opportunity to appear before the board. The New York Automobile Club is anxious to see a new city ordinance enacted which shall be on a basis of reckless driving rather than one of which a hard and fast rate of driving shall be the key note. It is held that if this is done, reckless drivers will be the sufferers at the hands of the police while drivers who are using due care will not be held to unreasonable and foolishly slow speeds.

KNOTTY POINT DECIDED

Believing that they are a power unto themselves, and greater even than the highway commission or the state law, the selectmen of Nantucket are girding up their loins to wage battle against the motorists. At least so they declare. Now, everyone on the island is waiting to see whether they are merely making a bluff or intend to make good. Their slogan is "total exclusion of motor cars from Nantucket." Nantucket is a little island off the southern coast of Massachusetts, where a lot of people go in summer. A steamer makes one trip a day there. In winter it is practically isolated. Three years ago the selectmen passed an ordinance that motor vehicles should be excluded from the island. Two years ago the next board did the same. This year it was passed again. Not until this summer did anyone bother to test it. Then one bright morning the selectmen and the natives were horrified to see a car moving about. Who dared defy their laws? they asked themselves. A consultation followed and the man was brought to court. But he was discharged because the ordinance was not legal until approved by the highway commission. So a petition was quickly filled out by some of the summer residents protesting the ordinance, so that the commission could rule upon it. The commission took a day off and went to the island to hear the merits of the case. Both sides were heard and the decision was given against the selectmen. Here was the jolt that Chairman McClintock of the commission gave the selectmen. "The state law on this case," said Mr. McClintock, "reads as follows: 'The city council of a city, or the board of aldermen of a city having no common council, and the selectmen of a town may make regulations as to the speed of motor cars and motor cycles, and as to the use of such vehicles on particular roads or ways, including their complete exclusion therefrom.' That covers the case. If the legislature had any intention of granting a body the right to exclude motor vehicles from the island of Nantucket, or from any town in a state it would have used the phrase 'all roads and highways' instead of 'particular roads and ways.' To exclude vehicles from all roads or ways would bar cars from passing through the state should a number of towns get together for the purpose and pass ordinances, and that would be unconstitutional. So Nantucket cannot bar motor cars from every section of the island and the board will not approve of the ordinance." The selectmen were discomfited and they declared they would take the matter to the courts. But the law is so plain that it is said they will be beaten and if they make an arrest, as they claim they will do if anyone else comes to the island with a car, they may find themselves tangled up in damage suits for false arrest and imprisonment. Some time ago a board of selectmen on the island seized some property of a gun club and the organization went to court and beat it, so it has been advised not to get into another such scrape. There are a number of people who want to take their motor cars to the island for the summer and they are behind the struggle that has resulted in a victory for them. The selectmen claim the petition of the motorists was not valid, as all the signers were not residents of the state.

CONNECTICUT'S MOTOR LAW

The motor measure recently enacted by both houses of the Connecticut state legislature takes effect August 26. Theodore Bodenwin, secretary of state, has issued a brief digest on the new law which is being circulated among the registered owners throughout the state and elsewhere as the case may be. The following are a few of the requirements noted therein:

1—Registration or reregistration of all motor vehicles and motor cycles in use in the state on or before September 1, 1907.

2—Registration annually thereafter.

3—Payment of fees as follows: $3 for each motor car rating less than 20 horsepower, $5 for each car rating 20 and less than 30 horsepower, $10 for each car rating 30 horsepower or over. If a car has two ratings the fee will be based on the higher one, and the fee for motor cycles is but 50 cents.

4—The sale of a car cancels its registration; reregistration is necessary.

5—The seller, if he purchases a new machine, cannot transfer his number plates as under the present law, but must register the new machine and pay the required fee.

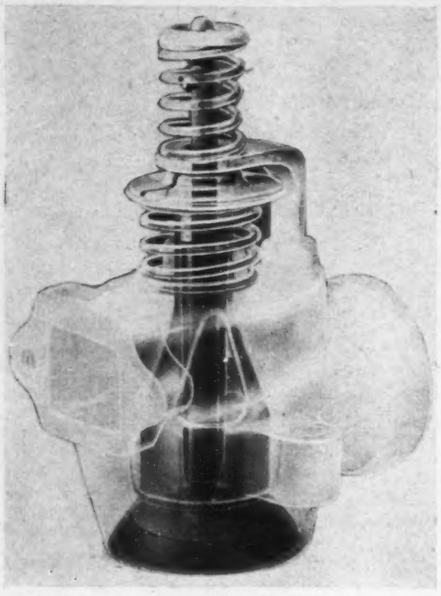
6—All owners and operators of motor cars and motor cycles must obtain license annually, the fee being $2 for a car and 50 cents for a motor cycle.

7—Only official markers may be used, which cost $1 for a set of two.

11—Manufacturers are taxed $100 for a certificate of registration, while dealers must pay $10.

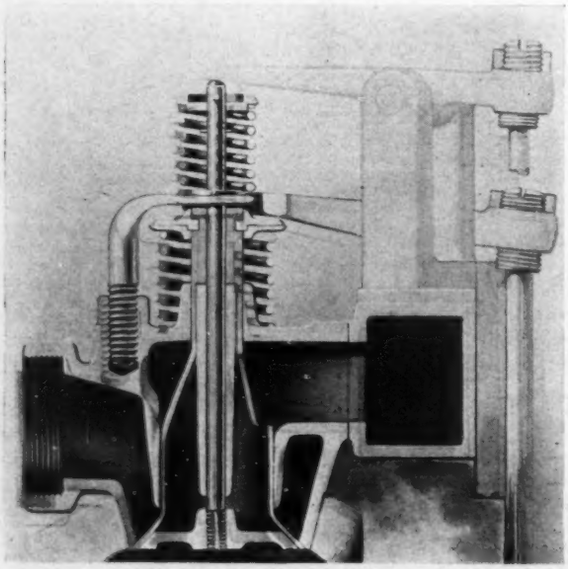
The Connecticut Automobile Association has had printed a digest of the new law which is approved by the secretary of state and duly circulated. This is much in the nature of a commentary and sets forth much that is confusing in the original measure. The association urges every owner and driver to regard the law at all times and invokes the aid of its members.

Motor Car Development

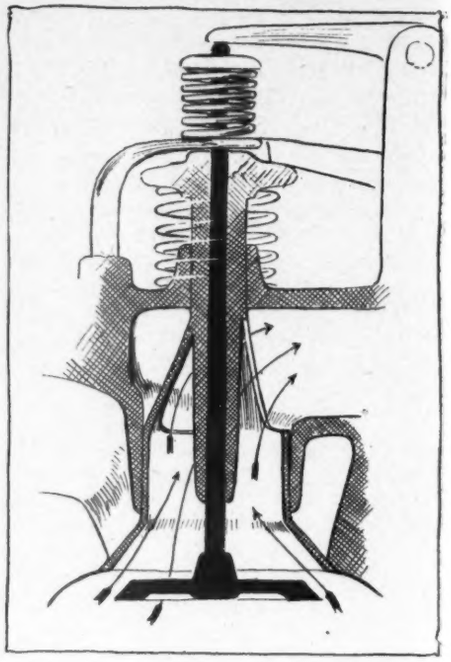


X-Ray of Concentric Valve Cage

CONCENTRIC intake and exhaust valves are the acknowledge novelty of the three 1908 models of the H. H. Franklin Mfg. Co., Syracuse, N. Y. Concentric means having a common center. Describe a circle 2 inches in diameter on a cardboard and using the same center describe another circle of greater or less diameter, then the two circles will be concentric—have a common center. Concentric valves are those having a common center, in other words, one valve is inside of the other—the same relation as the two circles described on the cardboard. How the Franklin concern locates one valve inside of the other is partly explained by the illustrations. In the lower left illustration on this page appears a section of a Franklin cylinder head with what at first glance appears to be one valve located centrally in it and opened by an overhead rocker arm. A second glance, however, reveals two valve springs, one of larger diameter than the other. This second glance also discovers two rocker arms as well as two lifter rods rising up the right side of the cylinder. A further examination shows a double piping connection—a pipe conection at the right of the valve leading into a rectangular shaped pipe and a threaded pipe connection at the left side. Looking closely shows two valves, intake and exhaust. The exhaust valve, a bevel-seated one, is located in what appears to be the flaring end of an inverted funnel. The funnel is the intake valve. The intake gases enter through the threaded opening at the left. The exhaust gases exit through the right pipe union into the rectangular shaped pipe which is the exhaust manifold connecting with the muffler. To open the exhaust or regular shaped bevel-seated poppet valve, the top rocker arm is depressed, its movement lowering the valve away from the flaring end of the funnel, the exhaust gases then passing the valve seating, entering the funnel and escaping through three triangular openings in the conical part of the funnel, thence through the right pipe connection into the rectangular-shaped manifold and to the muffler. To open the intake or funnel valve, the lower rocker arm is depressed, compressing the large diameter spring and the funnel is forced downwards into the cylinder head, leaving a ring opening between its flaring lower end and its seating in the cylinder head, at which time the intake gases enter by way of the threaded pipe connection on the left. When the intake valve is opened it forces or carries the exhaust valve downward with it, the exhaust valve still remaining tight on its seating in the flaring end of the funnel. The barrel or central portion of the intake valve is of sufficient length so that with the intake valve opened there is no possibility of the exhaust gases passing between the barrel part of the funnel and the valve cage and into the cylinders, nor is there any danger of the intake gases leaking out of the cylinder and into the exhaust manifold. One illustration shows the intake valve open, the arrows indicating the course taken by the mixture entering the cylinder; another shows the exhaust valve opened, the course of the exhaust gases being shown by arrows. Intaking is around the funnel, exhausting is through it. The exhaust valve has a diameter of 1 55/64 inch. In this year's Franklins the exhaust valves are 1 11/16 inches in diameter—11/64 or nearly 1/6 inch less in diameter. The funnel inlet valve has a diameter of 2⅛ inches, whereas in present cars the intakes are the same size as the exhausts. The funnel piece forming the intake valve is a high grade of steel, specially treated. The exhaust threads onto its stem and rigidly fastens thereon as well. Studs hold the valve cages in place.



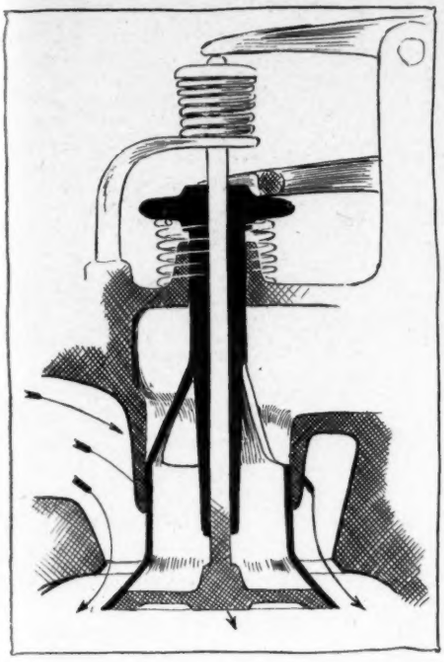
Anatomy of Franklin's Concentric Valves



The Exhaust Valve Opened

Why has the Franklin company introduced these concentric valves? As claimed by the company and borne out by the valve diameters, the designer gains a greater valve area, permitting of taking in a greater charge each suction stroke as well as insuring a better exhaust. This means increased horsepower. Concentric valves so arranged lighten the motor weight by the elimination of a valve for each cylinder, the funnel construction being a lighter construction than a valve. Concentric valves also add to the cooling facilities of the motor in that the cool incoming gas surrounds the passage in which the hot exhaust gases escape. On an exhaust stroke the inside of the funnel is heated, and on the intake stroke the outside of it is cooled. This alternate heating and cooling action should insure cooler exhaust valves than where the cool incoming charge only reaches them after the

Franklin Concentric Valves



Franklin Intake Open

cylinder space is filled with the mixture.

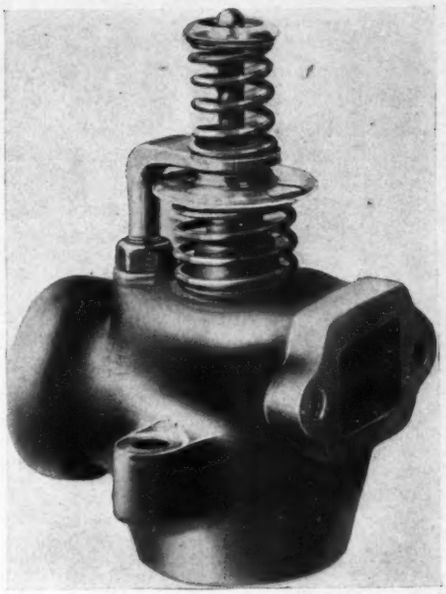
Hand in hand with the concentric valve the Franklin company has introduced the arched or crowned cylinder head, the valves being at the top of the arch or crown. This construction produces the semi-spherical or hemi-spherical combustion chamber that Dugald Clerk, the eminent British authority on gasoline engines, has been proclaiming for several years. The hemi-spherical combustion chamber exposes the least possible wall surface for a definite cylinder volume. A rectangular cylinder space, with the volume equal to that of the hemi-spherical style, would have considerable more wall space. Reducing the wall space in this manner reduces the amount of heat absorbed into the metal, which heat should be consumed in producing power. Incidentally this should increase the efficiency of the motor.

The valve opening or operation movement has not been changed in the 1908 machines, all valves being opened by a series of hyperbolical-shaped cams, carried on the camshaft within the motor crankcase. The top ends of the valve lifter rods are rounded to fit into the coned recesses in the studs carried in the valve rocker arms. Timing of the valves may be changed by adjusting these studs which thread into the ends of the rocker arms. The exhaust valve spring—the small-diameter spring on top—seats at its lower end on the flat top of a curved arm which screws into the cylinder head and is held therein by lock nut. The intake valve spring—the large-diameter, lower spring—rests on the valve cage and bears at its upper end against a washer secured into the top of the funnel valve. This spring is slightly conical in shape—with a larger diameter at the bottom than at the top. The valve action is claimed to be quieter than in the 1907 model and the crankshaft speed of the motor in revolutions per minute is as great as heretofore.

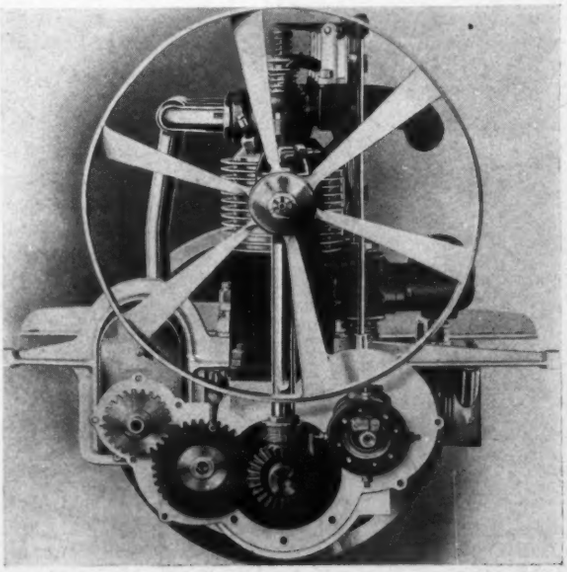
In this rather extended valve comment reference has not been made to the Franklin auxiliary exhaust valves at the bottom of the cylinder stroke on the exhaust side of the motor, which remain as used for several seasons. These auxiliary exhaust valves are opened direct from the camshaft through a set of cams with lifter rods bearing upon the valve stems, the closing of the valves being by spring. The Franklin designer, who makes use of the manograph for testing the compression and other conditions existing within the cylinders while the motor is operating, claims to have reduced the pressure on the piston during the exhaust stroke to 2 pounds, as against 45 pounds in cylinders without the auxiliary exhaust valves. The Franklin people have always claimed considerable reduction but nothing like so much as shown by the manograph.

But although concentric valves and hemispherical combustion chambers will prove the talking points on the three 1908 Franklins a general resume of the many 1908 minor changes must not be overlooked before entering upon them in detail. To summarize: As in 1907 so in 1908, the company will for next year build three models, G D and H, the same as this year. But all are more powerful. The 12 horsepower in model G becomes 16 horsepower; the 20 horsepower in model D becomes 28 horsepower, and the 30 horsepower of six-cylinder model H becomes 42 horsepower. In all three models concentric valves are used and in general the construction is the same, but the measurements of the parts different. In the G car the sliding gear-set remains, but the other two, D and H, carry selective gear-sets, affording three forward speed changes. On these two cars magnetos are installed with storage batteries for an auxiliary current. Cooling flanges are not integral with the cylinders, but are phosphor bronze flanges fitted over the cylinder walls by a special process. This metal is used as the company claims for it a higher conductive factor than copper.

Compared with cast iron the conductivity of phosphor bronze is as five to one. In pursuance of its policy in 1907 the company uses a different number of radiating flanges on the several cylinders constituting a motor. In model D, the four-cylinder car, the first cylinder has sixteen flanges, the second cylinder twenty, the third twenty-six and the fourth or last twenty. The reason for using the same number of flanges on the second and fourth cylinders is that much of the air passing through the bonnet strikes the sides of the bonnet opposite the third cylinder and is refracted off, striking the fourth cylinder, which although the rear one, in reality gets more air than the third cylinder. In model G, 16 horsepower, the cylinders have 3¼-inch bore and stroke,



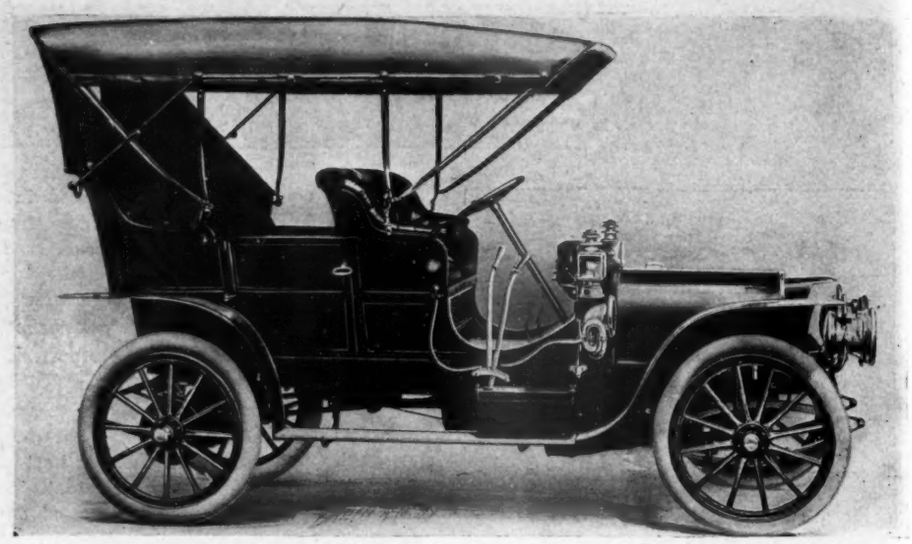
Cage of Concentric Valve



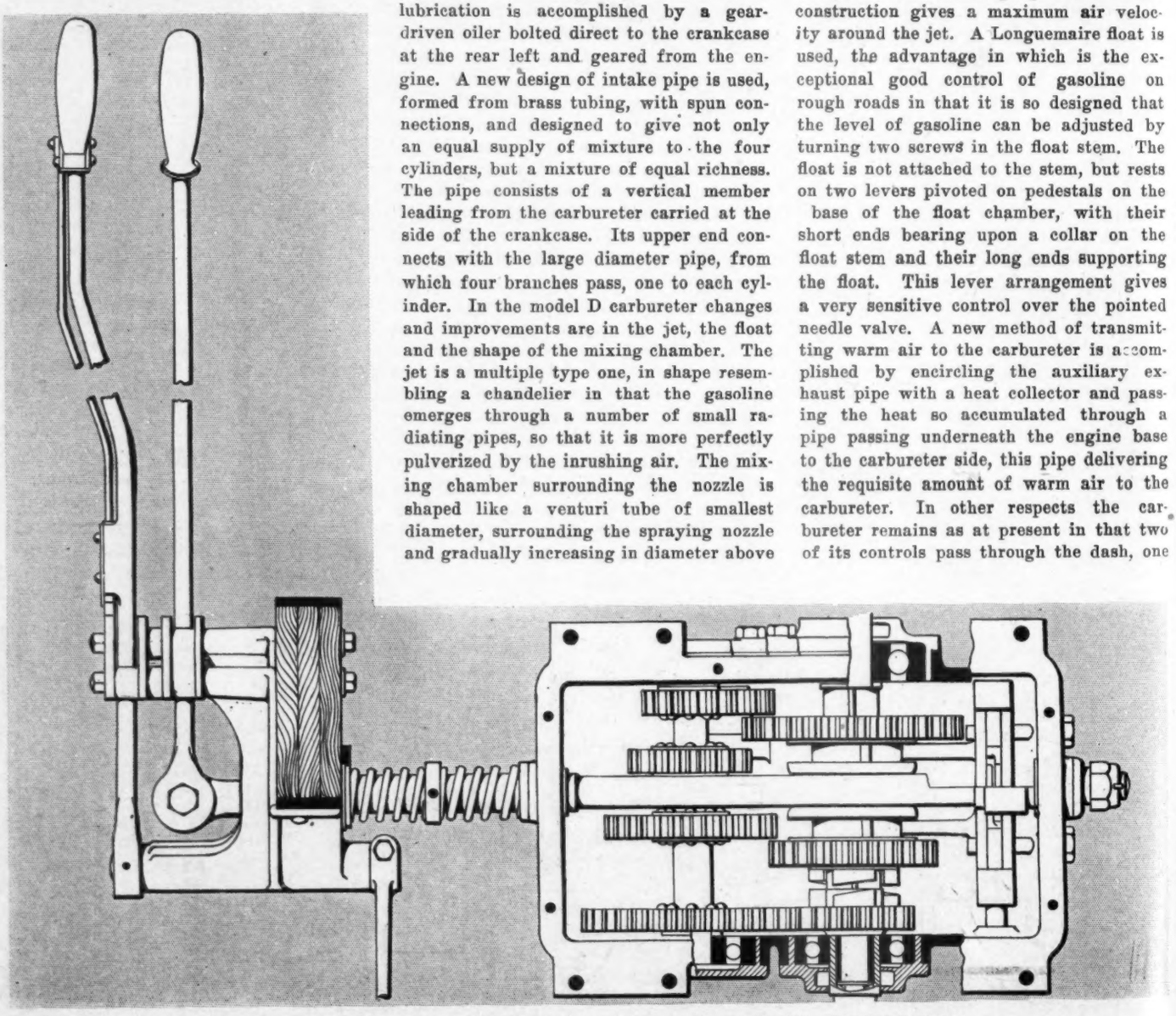
End of 1908 Franklin D Motor

the wheel base measures 90 inches, the same as at present, and wheels and tires have not been changed, the measurements being 30 inches diameter with 3 and 3½-inch in front and rear. In the D motor the 4-inch diameter of this season becomes 4¼ inches, the stroke remaining at 4 inches. The wheelbase, 105 inches, has not been increased. In the six-cylinder model H changes have been made. In all three models the company retains its full-elliptic springs, its wood frames, its multiple disk clutch, aluminum bodies, governor control, together with throttle and spark control lever, and uses a double fan scheme—a fan in front of the motor and fan blades in the flywheel. In the G car the front fan is dispensed with.

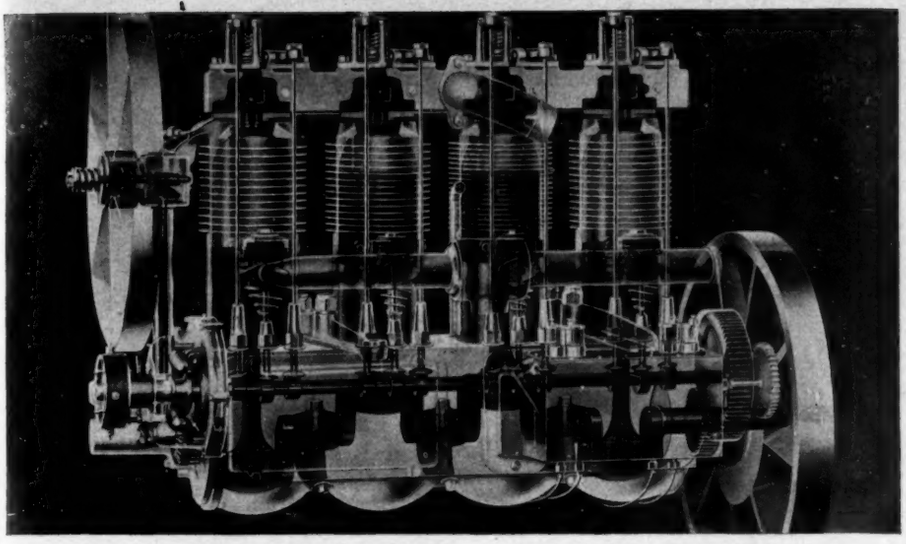
Although found in the 1907 Franklin motors, the oil baffle plate will be used in the 1908 engines as well, being placed as at present between the engine base and each cylinder and having slots for the movement of the connecting rods. Due to the presence of this plate, the crankcase oil is not ineffectively splashed upon the working parts, but is drawn up by the piston through the slots on the working sides of the cylinders, whence it gradually works around the piston. Other motor lubrication is accomplished by a gear-driven oiler bolted direct to the crankcase at the rear left and geared from the engine. A new design of intake pipe is used, formed from brass tubing, with spun connections, and designed to give not only an equal supply of mixture to the four cylinders, but a mixture of equal richness. The pipe consists of a vertical member leading from the carbureter carried at the side of the crankcase. Its upper end connects with the large diameter pipe, from which four branches pass, one to each cylinder. In the model D carbureter changes and improvements are in the jet, the float and the shape of the mixing chamber. The jet is a multiple type one, in shape resembling a chandelier in that the gasoline emerges through a number of small radiating pipes, so that it is more perfectly pulverized by the inrushing air. The mixing chamber surrounding the nozzle is shaped like a venturi tube of smallest diameter, surrounding the spraying nozzle and gradually increasing in diameter above this. Beneath the nozzle the diameter gradually increases, the aim being to cause a convergence of the inrushing air in the zone of the multiple jet nozzle. This construction gives a maximum air velocity around the jet. A Longuemaire float is used, the advantage in which is the exceptional good control of gasoline on rough roads in that it is so designed that the level of gasoline can be adjusted by turning two screws in the float stem. The float is not attached to the stem, but rests on two levers pivoted on pedestals on the base of the float chamber, with their short ends bearing upon a collar on the float stem and their long ends supporting the float. This lever arrangement gives a very sensitive control over the pointed needle valve. A new method of transmitting warm air to the carbureter is accomplished by encircling the auxiliary exhaust pipe with a heat collector and passing the heat so accumulated through a pipe passing underneath the engine base to the carbureter side, this pipe delivering the requisite amount of warm air to the carbureter. In other respects the carbureter remains as at present in that two of its controls pass through the dash, one



FRANKLIN MODEL D, 1908, 25-HORSEPOWER CAR



FRANKLIN'S 1908 THREE-SPEED SELECTIVE GEARSET, WITH SIMPLIFIED GEARSHIFTING LEVER



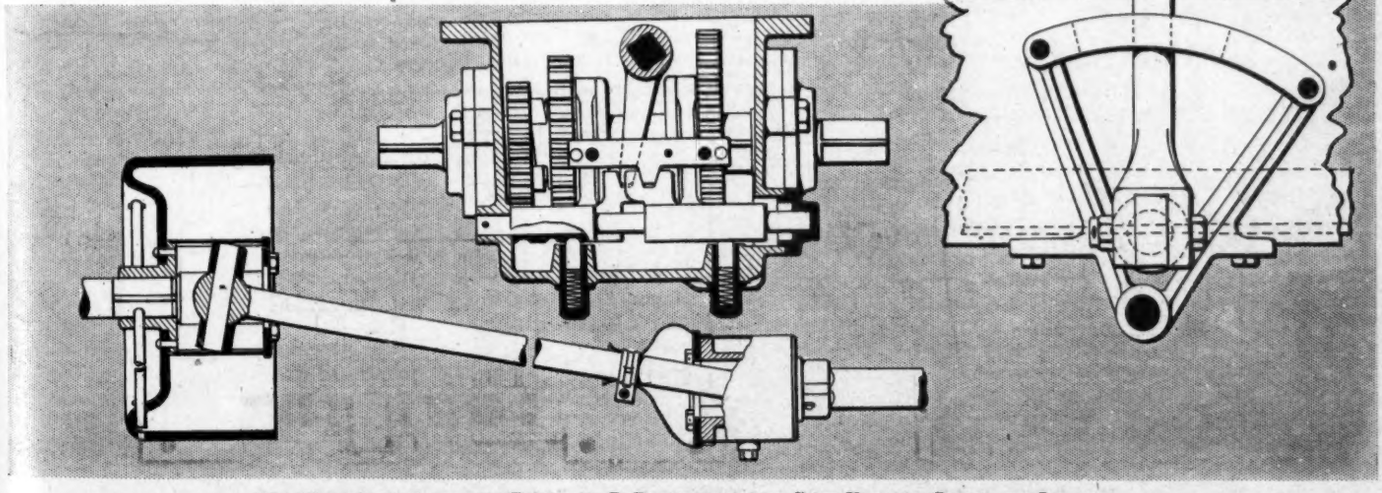
FRANKLIN 1908 MODEL D MOTOR WITH CONCENTRIC VALVES

for regulating the needle valve controlling the flow of gasoline from the float chamber to the nozzle and the other for priming purposes. Unchanged also is the butterfly throttle valve in the top of the mixing chamber, which valve is interconnected with another throttle in the bypass channel up the side of the mixing chamber, so that on high motor speed air enters the mixture without passing the needle valve and so not picking up too much gasoline.

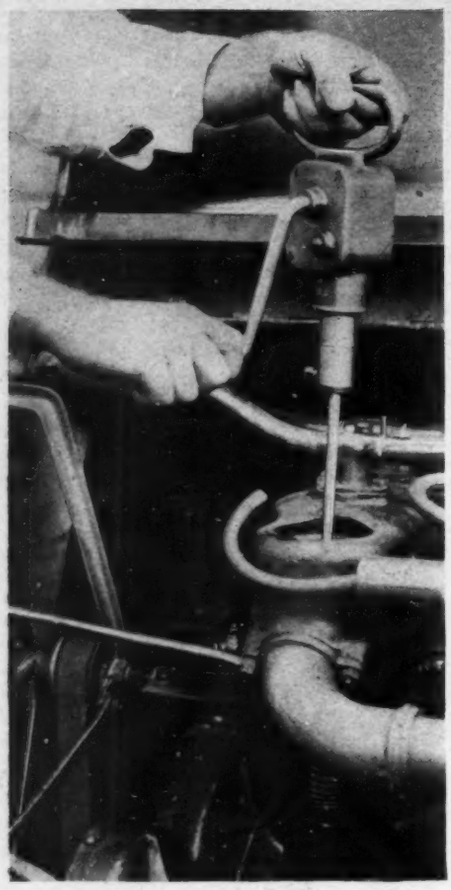
The ignition system has been developed by the use of a Bosch magneto carried on the motor base at the right rear and gear-driven from the crankshaft through an idler. The magneto fits into a D-shaped opening in the motor arm, the opening being formed to exactly fit the contour of the instrument, thus avoiding the necessity of separate metal straps to hold it in position.

In the front view of the motor the gear for driving the magneto appears. In addition the regular battery equipment is provided, giving two separate and independent ignition systems, provided with double spark plugs, both mounted angularly in the cylinder crown on the intake side, one to the front and the other to the rear of the valve location. The timer, of Franklin make and recent patent, has all parts designed and made of such material as to make variations in the time of the spark almost impossible. Its design is of the roller-contact type, the contact block roller being of chrome nickel steel, the pins of Tugsten drill rod and all parts so shaped and hardened as to allow of little wear. As formerly, it is carried on the front end of the camshaft. Spark control has been simplified in that the lever which advances the timer also varies the timing of the spark in the magneto. The governor remains unchanged, its construction being the same as during the last two seasons. The starting crank is now arranged to prevent accidents by back firing as well as striking the hood with the crank when the hood is raised. The Franklin custom of supporting the motor on the main frame of the car through separate cross members is retained, these cross members passing, one between the first and second, and the other between the third and fourth cylinders above the crankcase. They rest on angle pieces supported on the inner sides of the frame members. The front piece has a T-shaped cross section, whereas the rear one is an angle-shaped member. The crankshaft on model D is made of nickel steel especially treated, giving to it a tensile strength of 120,000 pounds. Connecting rods are made of carbon steel. The camshaft gear, made from rawhide, is placed in a dust-tight case at the rear of the engine, this gear driving direct from a pinion on the crankshaft.

The clutch is as used in 1907, being of the multiple disk type, with disks of phosphor bronze and steel, both sets carried within the enlarged hub of the flywheel and operating in oil. The engagement spring is of the spiral conical style, the large diameter part bearing upon the clutch disk carrier, insuring pressure on the disks at their perimeters as well as near the center. The transmission used is entirely new, being of the selective type, giving three forward variations and one reverse. The two sliding units are on the squared mainshaft. The aluminum gear-case is exceptionally compact and of oblong shape, with the long diameter crosswise of the car and the countershaft to the left of the mainshaft. Instead of dividing the case into upper and lower halves in



NEW UNIVERSAL JOINTS IN FRANKLIN D DRIVESHAFT AND SIDE VIEW OF GEARSHIFT LEVER



USING JEF VALVE GRINDER

line with the shaft bearings, it is made with a pair of front and rear openings, through which the main and countershafts are inserted and in which the ball bearings carrying them are locked. The entire top is covered by an aluminum plate. The gear shifter rod lies crosswise of the car and passes through the length of the gearbox. On its end within the gearbox it carrics a depending arm taking up the two gear-shifting yokes.

Last year the Franklin people introduced what they termed a self-finding gear shift, which has been supplanted with a new selective type change gear arrangement. This mechanism makes gear shifting simple and quick. One of the peculiar points is that the H slot used on all other selective gear shifts has been done away with. When the gear shift lever is perpendicular, it is through spring tension automatically placed in neutral, N, position. To change from this position to low, L, it is only necessary when placing the hand upon the lever to slightly press out on it and pull back into mesh. For reverse, R, the same movement is made, except that instead of pulling back on the lever, it is thrown forward. To place the gears in high position, H, the lever is simply pressed in and pulled back, and for intermediate, I, the lever is pressed in and forward. The gear lock and lever lock are all in one, and operated by one pawl on the change gearshaft by means of two gear teeth cut on one segment, which is a part of the trunnion. For each movement the spring tension is such as brings the lever when coming to the neutral position into neutral position, thus adding to the ease of operation.

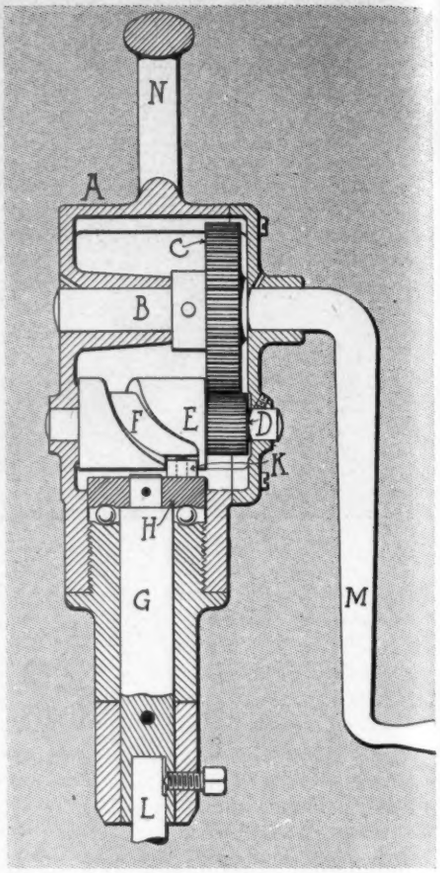
A new universal joint is used, of peculiar design, and which is illustrated herewith. The entire differential is made from hardened steel and in constructing the compensating gear plate has been removed, allowing of all gears to operate in oil all of the time.

As in seasons past, the axles used are of seamless steel tube, with spring chair brake carriers and axle spindles brazed on. The differential case is not brazed, it being driven to place and riveted. By so attaching the differential case it is possible to heat treat the entire axle housing without affecting the differential case, adding thereby strength and permitting of alignment of all parts. In the hub of each rear wheel is a small encircling oil reservoir backed up by flanging washers, which makes the hubs practically water and dirt proof. The braking surface has been increased. This is particularly true of the transmission brake, which has been made large to give to it long life and freedom from overheating. The brakes used are of the Raymond contracting type, and are kept from rattling by a spring device which holds them firmly in a suspended position when not in use. All brakes are lined with a special non-metallic lining.

The steering gear is of the bevel gear type. The steering knuckles are mounted on adjustable ball bearings, while the connecting rods and joints of hardened nickel steel are adjustable, yet dust proof.

The model D rear wheel bearings have been improved. In place of the plain bearing heretofore used on the air fan, ball bearings with ball thrust bearings have been substituted. The engine bearings are mostly of die-cast metal. Annular bearings are used on the rear wheels and in the differential to support the bevel gears, one being used on each side of the bevel driving pinion. This type of bearing is also used throughout the transmission. Nickel steel is also used in such as steering joints and transmission gear shifting gear bearings.

The body is made of sheet aluminum on an angle iron framework. The tool boxes, foot rest, position of levers and other features are all worked out with a view to convenience and appearance. The wood sill and elliptic spring suspension as originated by the Franklin company is used. The springs are 40 inches long. The

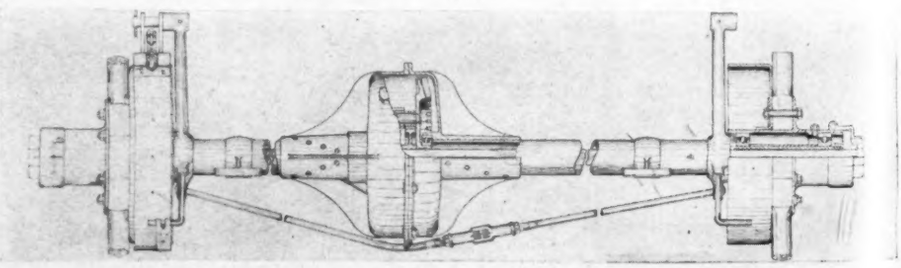


VERTICAL SECTION JEF VALVE GRINDER

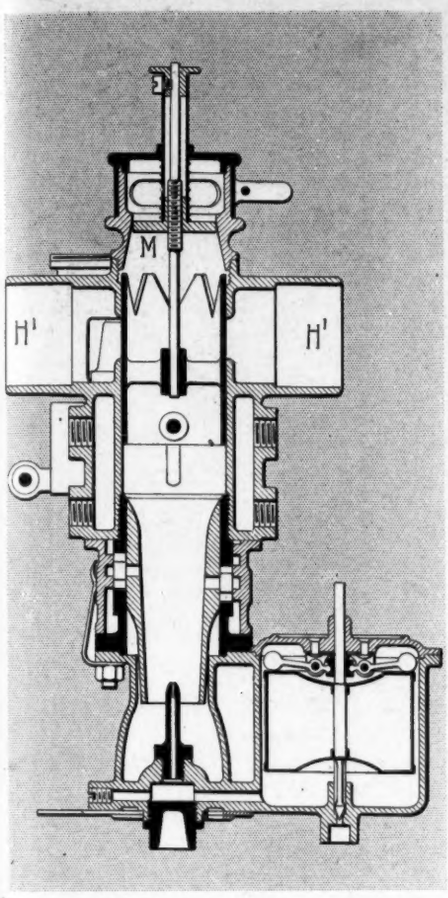
running boards have been lowered 1½ in., making access to the car easier. The front mud-guards have been stiffened to eliminate vibration. Finish and equipment are the same as heretofore.

JEF VALVE GRINDER IMPROVED

Announcement was made in these columns some weeks ago regarding the Jef valve grinder, manufactured and sold by the Jef Mfg. Co., 1562 Broadway, Denver, Colo., at which time attention was drawn to the simple back and forward screwdriver movement obtained by the machine by means of which valve grinding could be done in less than half the time required by the ordinary scheme of using a screwdriver. On these pages this week is shown the improved Jef valve grinder as it is at present manufactured and sold. The improved Jef is a simplification of the original Jef, the several gears, pinions and connecting rods having been replaced by three pieces, while the back and forward screwdriver action has been slightly



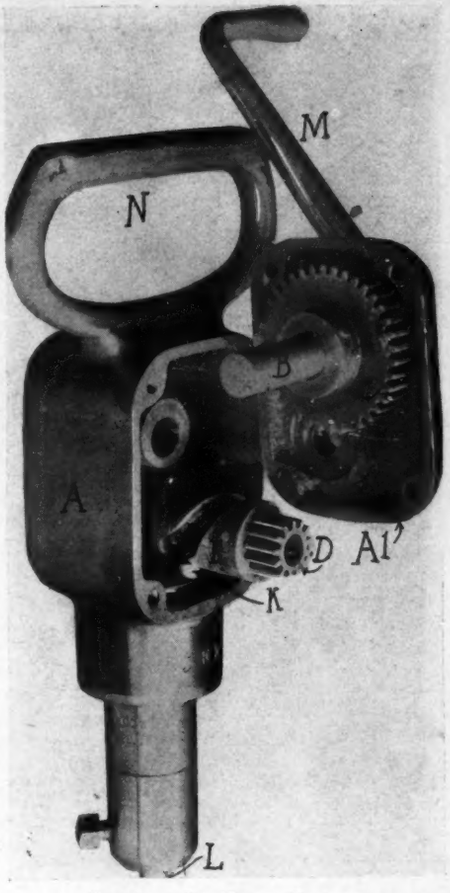
THE IMPROVED FLOATING BALL-BEARING FRANKLIN REAR AXLE



SECTION OF DE LA BUIRE CARBURETER

improved with its principles retained.

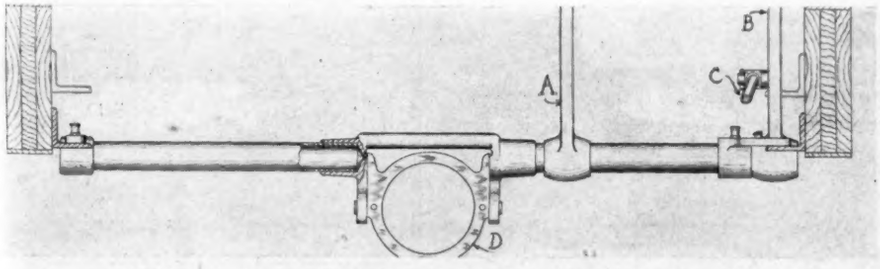
The mechanism of the Jef is now enclosed in a malleable iron casing A with cover plate A1, the latter retained in position by four countersunk screws, one at each corner. Holding the grinder in a vertical position with the screwdriver part entered in the slot in the valve head, as shown in one of the illustrations, a revolving of the crank M produces the desired back and forward movement of the screwdriver portion L, this member making practically a quarter of a revolution in one direction, followed by a quarter revolution in the opposite direction, and so on. This is done in a simple and ingenious manner by the spur gear C meshing with the pinion D, which is pinned to an enlarged cylinder piece E carrying a peculiar groove F. Working in this groove F is a small spool K carried on the disk H pinned on the upper end of the shaft G, which carries the screwdriver L. Revolving the handle M revolves the gear C and constantly rotates the gear D with the cylinder portion E in one direction. The groove F in this cylinder is half shown in the illustration, passing from top to bottom and half way round the cylinder E. On the hidden half of the cylinder this groove goes from bottom to top, thereby forming a continuous up and down pathway around the cylinder. As this cylinder revolves it raises and lowers the spool H with its bushing, the spool always of necessity remaining in the groove. Thus this up and down movement produces a short backward and forward movement of the shaft G and screwdriver L, which movement is communicated to the valve. Each revolution of the handle M gives four revolutions of the pinion D with its cylinder E and consequently four repetitions of the back and forward valve-grinding movement. The handle M can be given any speed desired. In order to ease the operation of the grinder a ball thrust bearing is used beneath the wheel H, as shown in the sectional illustration. The entire working parts are lubricated by an oil or grease packing and the device is so self-contained as not to require any attention for an entire season. There is no reason why a grinder of this nature should not prove valuable to every factory salesroom and garage in the country and why many private owners, who have up to the present used a screwdriver, should not adopt it. All gears are of case-hardened steel, shafts are hardened and all parts finished so as to make a good running grinder.



INTERIOR JEF VALVE GRINDER

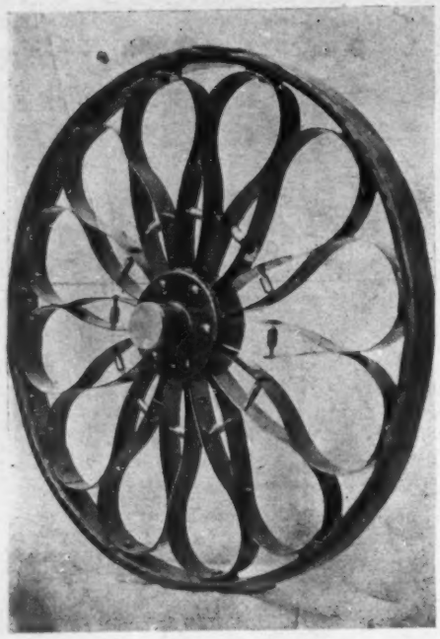
CARBURETER OF FRENCH DESIGN

Perhaps none of the other modern French carbureters combines simplicity and efficiency more than does the De la Buire used on cars of this make. In this carbureter the sliding barrel piston, with its roughly serrated top, not only controls the passage of mixture to the cylinders but further regulates the admission of atmospheric air to the motor when the mixture is prohibited. This feature is looked upon as particularly valuable when coasting, at which time the engine can be used as a brake. When there is no consumption of fuel the cylinders inspire a full charge of atmospheric air. In general details the carbureter is somewhat different from many on the market at present in that the chamber containing the float is so much smaller relatively than the vertical part forming the mixture space and containing the throttle. To insure a complete pulverization of the entering gasoline the lower portion of the mixing chamber takes the form of an inverted cone, with the small end slightly lower than the top of the standpipe, through which the gasoline enters. The exact relation of this standpipe to the mouth of the inverted cone is an important point in connection with the carbureter and the maker has arranged to raise or lower the cone part by the assistance of a rotating barrel, so that its lower end embraces more or less of the standpipe and so increases or lessens the air current, which gives a better or worse pulverization. The piston throttle, in its illustrated position, entirely shuts off the connection H1 with the motor, and, at the same time, the auxiliary air valve M in the turret portion above the throttle is closed. When the lowering of the throttle there is a corresponding opening of the valve M, both accomplished by the throttle connection with the steering wheel or accelerator pedal. The relation of the throttle to the auxiliary air valve M is variable in that the valve M threads on its stem and can be raised or lowered, thereby changing the relation of atmospheric air that enters the mixture with the throttle opening. With the throttle raised to its present position and all mixture passage to the motor cut off it is possible to open the atmospheric air valve by a still further movement of the accelerator pedal or steering wheel lever, the valve for the admission of this air not appearing in the illustration but being opposite the center of the mixing chamber.



FRANKLIN CROSS SHAFT, CARRYING CONTROL PEDALS

DEVELOPMENT BRIEFS



THE PADUCAH SPRING WHEEL

TELLS GASOLINE LEVEL

A simple gauge, the Perfecto, for telling the level of gasoline in the fuel tank of a car has been patented by W. F. Pagel and is now manufactured and sold by the W. F. Pagel Co., 242 Temple court, Minneapolis, Minn. Of the two illustrations of the Perfecto gauge on this page that on the left shows the instrument as carried on the dash of the car and seen by the operator. The other illustration shows a side view of its construction. In the left half of the illustration the dial is intended for a tank 12 units deep and the pointer would indicate this tank to be one-twenty-fourth empty. Should the indicator hand point towards 6 the tank would be half full. Its operation is as follows: The pipe A leading from the gasoline tank to the carbureter has a union with the compartment B of the instrument in which is a float C. This float rests on the top of the gasoline in the instrument, the level of which is the same as that in the gasoline tank. From the float C a cord passes upwards through the narrow neck of the instrument and winds on a pulley. On this pulley is a small pinion in mesh with a large gear on another shaft above the pulley. On the end of this shaft is the indicator, which works over the dial of the instrument. Should the gasoline level fall the float C will drop, imparting a part revolution to the pointer on the dial. In this way the exact level of fuel in the gasoline tank is indicated on the dash of the car. The instrument is made of polished brass designed to be carried on the car dash, and its dial gives the number of inches or gallons in the tank.

WHEEL WITH SPRING SPOKES

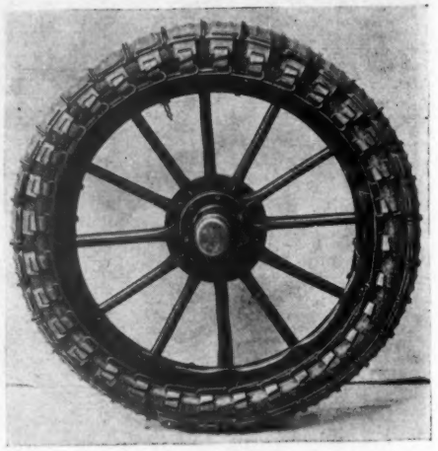
Parham & Lack, Paducah, Ky., inventors and manufacturers of motor car wheels and tires, have brought out within the past few months a style of spring wheel intended especially for different sizes of motor cars. Resilience in this wheel is accomplished by an interconnected series of spring spokes, which are made of flat ribbons of steel attached at one end to the wheel hub and at the other to the inner side of the rim. These ribbon spokes are arranged in pairs, the springs constituting each pair being flat against each other where they enter the hub but bowing outwards, thus forming a loop before attaching to the rim. Adjacent ribbons bear upon each other at the largest-diameter portion of the loop, thereby forming an interresiliency among all of the spokes. Those spokes between the hub and the ground have their loop diameter increased, due to the weight of the car, whereas the spokes diametrically opposite from these have their loop diameter reduced, due to the transference from one spoke to another of the load carried on the wheel. The company claims that the wheel not only stands up well but gives good efficiency, that it is not too heavy.

THE ARMOR THAT'S INVINCIBLE

Manufactured by the Invincible Tire Armor Co., Hartley, Ia., the Invincible tire armor intended as a covering for pneumatic tires on motor cars comes as one more of those many useful tire protectors which have been known to the public for the last few years. The Invincible is not a woven chain or armor covering for the tire tread but a series of interlocking armor plates which cover the tread of the tire and have side links for connecting with rings with turnbuckle, one of which lies close to the wheel rim at each side of the tire. The Invincible is put on with the tire deflated and is prevented from slipping on the tire by the air pressure. On each armor plate is a transverse rib for gripping the ground.

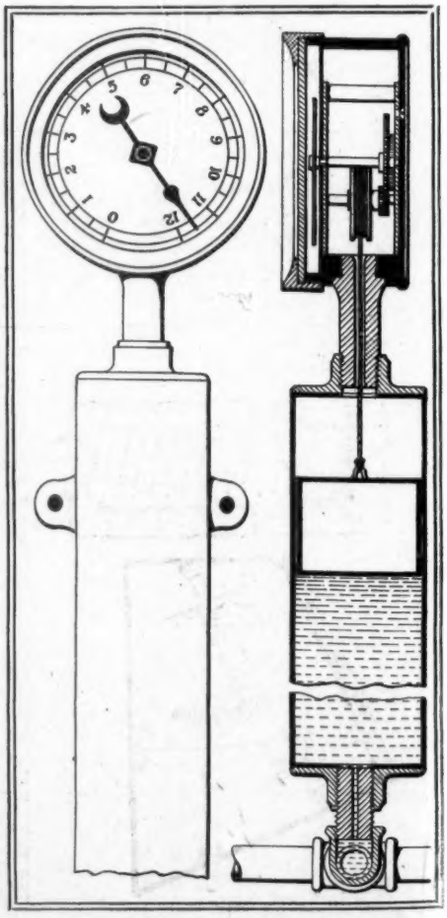
VISE FOR MOTOR USE

The Pittsburg Automatic Vise and Tool Co., Pittsburg, Pa., has thought out a vise suited to the many requirements of the motor car operator, such as holding a piece of metal while it is being filed. To the floor, running board or seat is attached a small and unobtrusive base, 1¾ inches in diameter, which is a fixture, and the vise is attached to this when it is to be used and at other times it is packed away in the tool box. There is no complication about the insertion of the vise into the work into almost any imaginable position. base. It is simply set in the socket—in



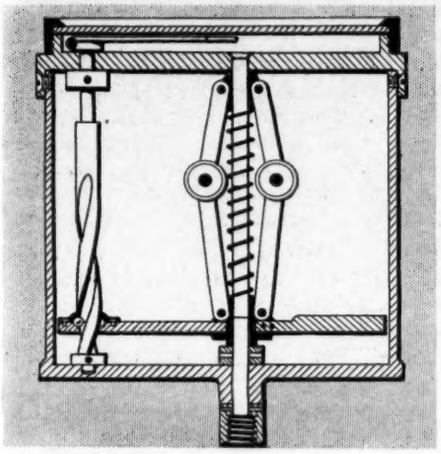
INVINCIBLE TIRE ARMOR

which it is free to turn in a circle. As soon as the jaws are tightened on a piece of work, however, the vise is automatically clamped in its base and cannot move. Release the work and the vise is again free to swivel. There is another swiveling motion. The jaws can be swung clear around on the axis of the screw, and, as in the case of the horizontal movement, the tightening of the jaws on the work clamps the swivel automatically.



THE PERFECTO GASOLINE GAUGE

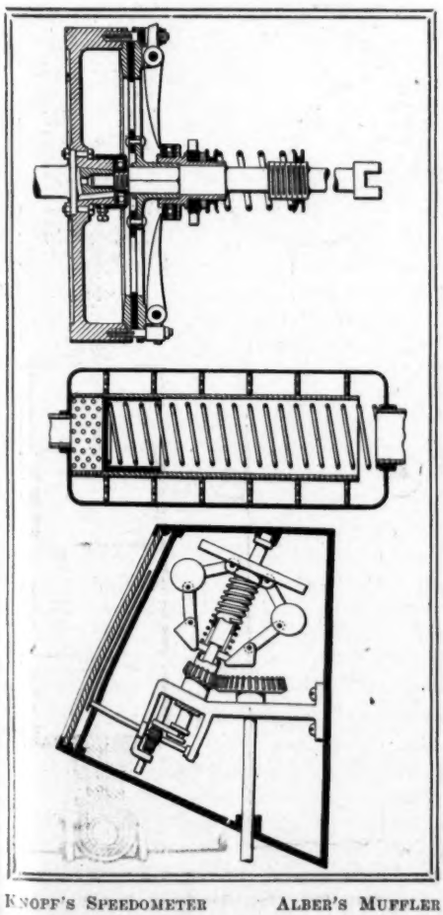
CURRENT MOTOR CAR PATENTS



DAVIS' SPEED RECORDER

Automatic Tire Pump—No. 863,095, dated August 13; to O. D. Rosseau, Seymour, Ia. This pump consists of a hollow rubber compartment inserted in the air tube of the tire by cutting the air tube and fitting the ends over the ends of the pump compartment. In this hollow pump compartment are three valves, one at either end communicating with the air tube, and the third in connection with the outside air. A set of spiral springs tends to keep the pump compartment expanded. The weight of the car, however, compresses the compartment, but when the wheel revolves and the part of the tire carrying the pump leaves the ground the springs expand the pump compartment, drawing air from the atmosphere. Again when this portion of the tire reaches the ground in the revolution of the wheel, the compartment is closed, forcing the air into the tire.

SHORT'S DISK CLUTCH



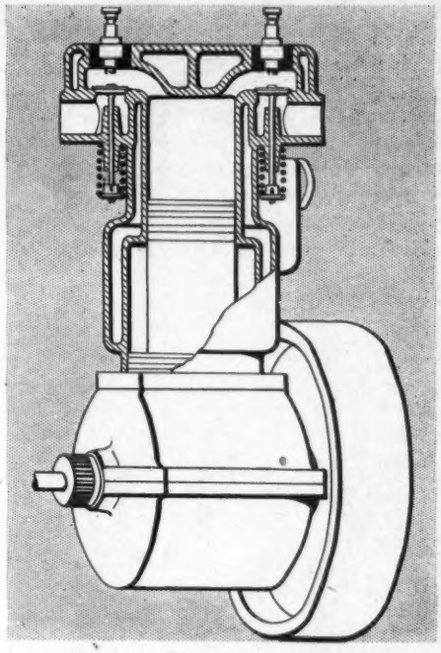
KNOPF'S SPEEDOMETER ALBER'S MUFFLER

Governor Speed Recorder—No. 863,266, dated August 13; to I. P. Davis, Springfield, Mass. In this speed indicator the two governor weights are supported by four links, two connecting with a permanent collar on the top of the shaft of the instrument and the other two with a sliding collar. This sliding collar has a projection at one side with a threaded opening. Passing through this opening is a spiral shaft on the top of which is the pointer of the instrument.

Three-Disk Clutch—No. 863,064, dated August 13; to H. J. Hass, F. P. Nehrbas and J. R. Short, Buffalo, N. Y. In this clutch two metal disks are carried on the flywheel. Between them is another disk secured to the clutch shaft in communication with the transmission. A spiral spring surrounding the clutchshaft serves for engagement. The driving and driven shafts are prevented from moving axially with relation to each other, because of two sleeves with opposing end flanges having a race of ball thrust bearings separating the flanges.

Centrifugal Speed Indicator—No. 863,403, dated August 13; to C. Knopf, New York, N. Y. In this speedometer, which operates on the centrifugal speed principle, through a pair of governor weights attached to a sliding sleeve, the power is transmitted from the flexible shaft connecting with the road wheels to a pair of slightly beveled pinions, one on the end of this shaft and the other on the rod carrying the disk on which the governor balls are attached. The sleeve, which the out-and-in movement of the governor balls moves up and down, connects at its lower end with a rack in mesh with the small pinion on the shaft carrying the pointer of the instrument, the pointer as in all other cases moving over a graduated dial.

Variable Bore Motor—No. 863,142, dated August 13; to L. Boudreaux and L. Verdet, Paris, France. The cylinders in this motor are of two diameters, the top half of minor diameter and the lower half of major diameter, the difference in diameter being a fraction of an inch or more. The piston is of double-diameter construction, furnished with two sets of piston rings, one for each diameter. Intake and exhaust valves admit and release the gases from



VERDET'S VARIABLE-BORE MOTOR

the upper or small diameter portion and other valves function for the major-diameter cylinder, which, by the way, serves as a low-compression cylinder in that the exhaust gases from the small-diameter piston are expanded in it. The walls of the cylinder are water-cooled throughout the length of both cylinders.

Four-Part Air Tube—No. 861,434, dated August 6; to T. J. Chatham and J. S. Holliday, Turlock, Cal.—Instead of making the air tube for a pneumatic tire with one air space the inventor makes it with four compartments formed by three longitudinal radial partitions. The inflation valve connects with each of these four compartments through a separate connection with check valve, so that in case one compartment is punctured the other three retain their air supply.

Variable-Pressure Muffler—No. 863,342, dated August 13; to E. T. Alber, Ann Arbor, Mich. Within the cylindrical external casing of this muffler is a concentric cylinder of half the diameter extending from end to end of the casing and provided with perforations at the entrance end and opening into the muffler proper at the other end. The ring space surrounding this inner cylinder is divided into seven compartments by six radial partitions, all of which are perforated. Within the inner cylinder is a piston constantly forced towards the entrance end of the muffler by means of a spiral spring. The entering gases strike upon the head of this piston and, according to the pressure of the exhaust, the internal capacity of the muffler is increased every minute by the varying position of the piston.

THE READERS' CLEARING HOUSE

REMOVING CARBON DEPOSITS

New York—Editor Motor Age—Noticing the query by W. A. C. in the Readers' Clearing House for June 20, I would suggest that I have found the best way to clean carbon from motor cylinders—without removing the cylinders—to be by the use of small iron scrapers, suitably bent to be introduced through the spark plug holes or the plug holes over the valves, according to the type of cylinder. Injecting kerosene softens the carbon or dust deposit, but in my own motor at least I never found it to have much effect in detaching it. To aid in the exploration I use a small battery lamp, protected by a cage of wire and introduced through the opening over the valves. I use also a dentist's flat mirror to help me see around the corners. My own practice is to take out the exhaust valve and scrape the debris into the valve chamber, from which it is carried into the muffler or out by the muffler cutout. My motor is of a high compression type, requiring frequent cleaning, which would have been very expensive if I had had to remove the cylinders for the purpose. With the aid of the above described outfit I can do the job in an hour—there are two cylinders—and can get the whole inside surface absolutely clean. Of course it is necessary to do the job thoroughly, as otherwise partially loosened fragments of carbon would heat much more readily than when firmly attached and would only aggravate preignition.—Herbert L., Towle.

QUESTION OF BALANCE

Custor, O.—Editor Motor Age—Please give me through the columns of the Readers' Clearing House the following information: Will a two-cylinder four-cycle motor, with cylinders set at an angle of 56 degrees both connecting rods attached to the one crankthrow and the motor receiving one impulse from each cylinder alternately at each revolution, reduce the vibration of the motor to a certain extent or altogether when properly balanced? What is a two-cycle three-port motor and what are its advantages over the two and four-cycle motors? Can a two-cylinder four-cycle opposed motor be properly balanced so as to throw in the clutch at high speed and is there any advantage in doing so? This seems like a foolish question, but I am making this inquiry to settle an argument I had a few days ago.—H. Thielen.

There is no special virtue in an angle of 56 degrees for the cylinders. Any two-cylinder engine, both of whose connecting rods work on a single crankthrow, will vibrate, owing to the fact that both the pistons will move in the same general direction. The vibration will be maximum when the cylinders are parallel or opposite and will be as little as it is possible to make it when the cylinders are 90 degrees apart. The two-cycle three-port motor is one which, instead of admitting air to the crankcase through a check valve, admits it through a port near the base of the cylinder and below the exhaust or inlet port. This port is covered by the piston at all times except when the piston is at the top of its stroke; consequently the upward movement of the piston creates a partial vacuum in the crankcase. Near the end of the up-stroke this inlet or third port is uncovered by the bottom of the piston, thus permitting air to rush in to fill the crankcase. This type of engine is entirely valveless. It has the objection that there is a certain loss of power involved in having the piston work against a partial vacuum on its up-stroke. The advantages of this or any other form of two-cycle motor over the four-cycle type are summed up in its simplicity and low first cost. The condition of the engine as regards balance has nothing whatever to do with its ability to carry its load when the clutch is thrown in, whether at high speed or otherwise.

CURRENT DISCHARGE

Richibucto, N. B.—Editor Motor Age—Kindly answer me through the Readers' Clearing House how many amperes a single-cylinder engine with a 5½-inch bore and 6-inch stroke, attached to a single unit Splitdorf coil, should use.—H. O. L.

With the circuit continuously closed at the timer and the trembler constantly working, the ammeter should show not more than 2 amperes. With the engine running and the timer making and breaking contact, the average current as indicated by the ammeter should be under 1 ampere. See article on spark coil tremblers in Motor Age of August 8 for proper method of adjustment.

EDGE ON LIVE AXLE

London—Editor Motor Age—The awards in the Scottish trials are a very direct proof that the modern motor car must have a live axle. It is noticeable that every first prize in the Scottish trials has been won by a car with a live axle. The development of the live axle leading up to this success is rather interesting. In 1902 Mr. Napier made the first powerful pleasure motor car with a live axle, the car that won the James Gordon Bennett cup race in 1902. Almost every foreign manufacturer and a great many British ones laughed at the idea, prophesied failure and said powerful cars could not be successfully made with live axles. From the date of Mr. Napier's introduction the live axle on powerful cars has steadily gone forward until, in my opinion, today no modern car can be termed a first-class vehicle unless it has a live axle for either racing or touring. To take the chief and important races since 1902 is interesting reading. The success of the live axle began in 1902—the Napier won the Bennett cup race. In 1903 the Ardennes race, light class, was won with live axle. In 1904 both the heavy and light class were won with live axle, also the Vanderbilt cup race. In 1905 the Vanderbilt cup, Brescia circuit, Florida and the Ardennes were all won on live axles. In 1906 the grand prix, Vanderbilt and Florida races were won on live axles. In 1907 two of the races in the Ardennes were won on live axles. The world's record for reliability under R. A. C. rules has been achieved on a live axle six-cylinder car. The greatest distance in 24 hours has been done on a live axle six-cylinder, and now every class of the Scottish reliability trials has been awarded to the live axle car. Nothing but the fact that certain factories have machinery to turn out chain-driven cars causes them to be continued to be manufactured or offered to the public. I cannot believe that anybody who has driven on a live axle car would ever want a chain-driven one. Can anybody say one word in favor of them? One can understand the foreign manufacturer fighting against the live axle because of Mr. Napier's success with it, but it is just as useless to fight against a live axle as against the six-cylinder for powerful cars.—S. F. Edge.

By live axle, it is taken that Mr. Edge refers to shaft-drive through a bevel gear.

HORSEPOWER FORMULA

LaSalle, Ill.—Editor Motor Age—In your August 15 number in answer to a query you give the formula adopted by the Association of Licensed Automobile Manufacturers for ascertaining horsepower. This formula—

$$\frac{D^2N}{2.5}$$

—does not take into consideration stroke, speed, compression and other less important items, except vaguely in the constant 2.5. It is usually accepted that a gas engine power varies directly as the speed and as the length of stroke, making them important factors in any reliable formula. According to the A. L. A. M. formula an engine with a 4 by 6-inch cylinder will not develop more power than one with a 4 by 3-inch cylinder, which is not true. As a matter of fact there are but few engines on the market whose horsepower figured by this formula will correspond with that claimed by the manufacturers; the formula giving usually higher power rating, and varying very much from the results of more accurate formula. Why not recom-

mend some such formula as the following, which, while not accurate, is close enough for ordinary purposes—

$$\frac{D^2LRN}{16{,}500}=p$$

—in which D is the diameter of the piston and L the stroke in inches, R the number of revolutions per minute, N the number of cylinders and p the horsepower.—V. A. M.

MORGAN DEFENDS FLORIDA

New York—Editor Motor Age—The paragraph in the Current Comment column of last week's Motor Age calls for a little protest from the writer, also some explanation which may be of interest. Motor Age says that Florida by no means has so secure a hold on the midwinter racing game as might be supposed and that there are other candidates, including Charleston, S. C., where it is said a beach even superior to that found in Florida is available. Up to the present time wise men and explorers have tried in vain in all parts of the world to find a beach equal to the one introduced to the world by the writer and others. They have even gone so far as to investigate and proclaim the merits of the beds of dried up lakes in California. Atlantic City, Virginia Beach and Cape May had beaches to offer, but what beach holds all the records from 1 to 100 miles? It is the Ormond-Daytona beach on the east coast of Florida that has brought fame to the United States and that has lured drivers from Europe who have not appeared on any other course in this country. Speaking of Charleston—who is the discoverer of the 5-mile course known as the Isle of Palms, that would join conclusions with the Florida beach? It is doubtful if the entire 5 miles can be used for racing and it is equally doubtful if it compares in any way to that of Florida. The beach, however, is available and men with sufficient money and enterprise ought to be able to give a tournament there. P. H. Gadsden, president of the Consolidated Street Railway System, asked the writer to give a tournament there years ago, but Charleston could not provide the money for the prizes. Mr. Gadsden came to New York with a view of getting the Charleston course added to the Florida circuit. Motor Age says: "Charleston ought to come in for at least a little fair consideration on the part of the promoters of the winter races, providing the promoters are not too closely allied with the hotel interests in Florida." Allow me to say there would never have been any races, in all probability, in Florida if the hotel interests had not been the first to offer encouragement. It is the hotel interests that back the tournaments to a large degree, and the past 2 years, through the writer, financed them almost entirely. As long as I am interested in the Florida tournaments and long after they shall have become only a memory, it is my sincere hope to be more or less closely allied with the men who made the tournaments possible. The Florida tournaments have offered some obstacles. Many people laughed when the writer proposed to give a tournament so far away. The expense of taking cars and drivers to Florida is no small matter, but the advertisement the winners got undoubtedly paid for the time and expense incurred. As to the hotel interests—that part of the complaint has been overdone. People who have paid much higher hotel rates in New York for no better accommodations have complained of the rates in Florida. It must not be forgotten that H. M. Flagler has an investment in railroads and hotels in Florida of not less than $50,000,000 and it may not surprise some people to know that the hotels do not pay Mr. Flagler more than 4 per cent on his big investment. This is not to be wondered at, because the houses are only open for about 90 days each year and all the rest of the time they earn nothing. The same can be said of the railroads; so it does not take much imagination to suppose that Mr. Flagler could invest his millions in other ways which would bring sixfold the returns—Standard Oil stock, for instance. It is that carping and unfair and unknowable criticism that is causing trouble with national enterprises in this country today, and that same abuse is responsible for the shutting down of the great railroad extension work as well as the railroad shops and the cutting off of all trains on the Florida east coast excepting one a day, by Mr. Flagler and his manager. The Flagler millions have converted the Florida east coast from a wilderness to one of the most delightful places in the world, and if the present conditions maintain it will be back to the wilderness for the Florida east coast. The Record of St. Augustine, in speaking of the state legislature, which doubled the taxes on the Flagler property last winter, says editorially: "If the same policy continues next winter there will be no tourists—the great hotels will not open their doors—the legislature will have won its victory at last. Henceforth we may find that Florida will remain for Floridians indeed and we can develop our own country in our own way without 'dictation' or interference from others. And then we can tell each other how we like it." In regard to the racing and its management the past 5 years, the banner years being 1904 and 1905, when the great amateurs were in competition there, it may be well for the writer to point out that racing management on a beach of the extent of that in Florida is a hard proposition to conduct successfully. The best men in racing management have usually officiated, but to run a lot of races on a beach is different from running a Vanderbilt or a 24-hour race on a mile track. All you have to do in the latter is to start them going and they go until they finish or until they are out, but on the beach the drivers get away from you some 10 or 15 miles and something goes wrong with their machines and you cannot well reach them without sending other machines after them. There are other conditions in beach racing that provide obstacles for the management which I do not care to enumerate. The writer personally solicited over $10,000 worth of prizes for past Florida meets, but the burden has become too heavy and some other arrangements for securing the finances will have to be made for the next meet. The Florida East Coast Automobile Association, which has done so much for the meets, does not care to shoulder the responsibility, but I hope for the sake of the sport and industry the races in Florida will continue.——W. J. Morgan.

BLOWER DESIGN

Pittsburg, Pa.—Editor Motor Age—Will you please describe how to make a centrifugal blower, to run at 1,500 revolutions per minute? About what diameter of blower will be required to cool two 3¾ by 3½-inch cylinders, with the regular cooling flanges cast thereon?—F. H. Hess.

The design of centrifugal blowers is largely empirical, and hard and fast rules cannot well be prescribed. According to the best information obtainable, a blower designed on the following lines will answer the requirements: Diameter over blades, 17 inches; blades, eight, with area of 14 square inches each, substantially 4 inches wide by 3½ inches, measured radially. The tips of the blades should be curved slightly forward. The inlet should be 10 inches in diameter and the outlet 4½ inches in diameter. The casing should expand radially around its circumference, so as to give a clearance at the point of outlet equal to the 4½-inch circle. The discharge pipe should be smooth internally and any bends should have the largest practicable radius. If the air discharges downward over the cylinders, the cooling flanges should run vertically instead of horizontally. A speed of 1,500 revolutions per minute is rather slow for a centrifugal blower, and if that speed were increased a smaller blower could be used.

ENGINE MAKERS

Salt Lake, Utah—Editor Motor Age—Can you inform me where I can buy gasoline engines and all the attachments complete ready to put on buggy or spring wagons? I wish to buy by the wholesale. —P. R. McKinnis.

Correspond with the following concerns: Aurora Motor Works, North Aurora, Ill.; Austin Automobile Co., 88-92 South Division street, Grand Rapids, Mich.; Auto Engine Works, St. Paul, Minn.; Beaver Mfg. Co., 237 Oregon street, Milwaukee, Wis.; Beilfuss Motor Co., Lansing, Mich.; Ben Hur Motor Co., 120 Randolph street, Chicago; Bradford Motor Works, Bradford, Pa.; Waukesha Motor Co., Waukesha, Wis.; Westerfield Motor Co., 1525 Main street, Anderson, Ind.

STEVENS-DURYEA BEING LOADED ON TROLLEY MOTOR ROAD TO OCEAN CITY

Johnston Resigns as Treasurer—R. H. Johnston has forwarded his resignation as treasurer of the New York Motor Club to President S. B. Stevens, Jr.

First Dragon Racer Ready—The first of the special racing cars built by the Dragon Automobile Co., of Philadelphia, for the Vanderbilt cup race, which was postponed, is now practically completed at the Dragon factory, and J. W. Haynes is to tune it up for the road and beach. Charles L. Kenan, its constructor is putting on the finishing touches and at the same time assembling its mate, the second racer, which is also to be seen during the coming months in competitions and trials against time. The third car will not be assembled at this time.

Good Stunt by Gale—The harness horse brigade had an inning at Galesburg, Ill., last week, but the weather man dished out a lot of rain, which interfered with the plans of the horsemen. Friday the track was in poor shape—heavy and muddy. Men were put to work scraping it and at this stage of the game Carl Holdredge, of the Western Tool Works, which make the Gale in Galesburg, came forward with help. Hitching a drag carrying three men to a Gale car, he pulled it 5 miles at an average pace of 2 minutes 49½ seconds, turning off three-quarters of a mile in 54 seconds during the ride.

Meet for Baltimore—Baltimore is to get into the track racing game. From the City of Monuments comes the news that the organization has been effected of the Motor Car Racing Association, all the members of which are members of the Automobile Club of Maryland. The new association has secured a sanction for a race meet to be held on Labor day, at the Gentleman's driving park. The program will include a 50-mile championship for stripped touring cars; a 10-mile race for cars costing $5,000 or less; 10 miles for cars costing $3,000 or less and 10 miles for cars costing $1,500 or less; also a 5-mile free-for-all race and a 5-mile runabout championship. This will be the first sanctioned race ever held in Baltimore and the first motor race meet of any kind held there in 3 years.

Government Using Steamers—Two 30-horsepower White steamers, with seven-passenger Pullman bodies, have been in service at Oyster Bay since President Roosevelt went there June 12. The steamers meet every train and carry the president's guests to the summer capital. Recently Secretary of War Taft and Postmaster General Meyer were visitors and they were so delighted with the ride that the president had them driven from his residence back to New York city.

Blame Railroads—It is said that the extensive campaign of gravel road making in Indiana is being held up by the high rates charged by the railroads for hauling gravel. Commissioners of Daviess county and J. D. Moore & Co., contractors, have asked the Indiana railroad commission to compel the Southern Indiana railway to lower the gravel rates between Elnora and Odon. Although these towns are only a few miles apart, the railroad charges 60 cents a yard for hauling gravel.

Coast Reform—The Snohomish County Good Roads Association, which was organized at Everett, Wash., is in reality a motor organization. The following officers were elected: President, Dr. W. C. Cox; vice-presidents, E. M. Stephens, Monroe; William Hulbert, Everett; W. C. Brokaw, Edmonds; secretary, Elmer E. Johnston; treasurer, W. G. Swallow. The organization's initial effort was in the entertainment of the state press association. Twenty cars were placed at the disposal of the editors and tours about the places of interest were made during the afternoon. The association will devote its special attention to the betterment of road conditions. Snohomish is not too well supplied with good highways, but hopes through this effort to bring about a better feeling with the motorists and the farmers. It will urge its members to give proper regard to the rights of the farmer upon the roads, and to do everything possible to save him annoyance and danger from the fear which his horses may have of the motor vehicle.

Policeman to Set Pace—Motor cars are not allowed to go through the Forstenreider park in Bavaria without being preceded by a mounted policeman. This is a regulation enforced because a motor car ran over a wild pig recently, which animals are hunted in those parts.

New Club in Holyoke—Steps were taken a few nights ago to form a motor club in Holyoke, Mass. It is close to Springfield and there are a number of men there who own cars. Members of the Springfield club visited Holyoke and gave the Holyoke men some ideas on how to proceed with the formation of the new organization. As a result a temporary club was organized with C. L. Newton president and James J. Madsen secretary. The name and the by-laws will be submitted shortly after which it will apply for membership in the state organization.

Natural Gas for Fuel.—Natural gas threatens to supplant gasoline as a fuel. Interesting experiments are being conducted at Medicine Hat, Alberta. The natural gas is being bottled in tanks and will be exported. The present difficulty lies in obtaining a suitable material for the tanks, as the pressure is so great. Experiments are being carried on with aluminum and it is expected that this metal will prove suitable. The gas is taken directly from the ground in its crude state. It is claimed that when once placed on the market it will take the place of gasoline in several lines. If the tanks now being experimented with prove satisfactory the new commodity can be placed on the market at a price less than one-quarter that of gasoline, it is said.

A. M. C. M. A. Guaranty—The American Motor Car Manufacturers' Association recommends to its members the following guaranty to be known as the A. M. C. M. A. guaranty: "We warrant the motor vehicles manufactured by us for 90 days after the date of shipment, this warranty being limited to the furnishing by our factory of such parts of the motor vehicle as shall, under normal use and service, appear to us to have been defective in material or workmanship. This warranty is limited to the shipment to the purchaser, without charge, except for transportation, of the part or parts intended to replace the part or parts claimed to have been defective, and which, upon their return to us at our factory for inspection, we shall have determined were defective, and provided the transportation charges for the parts so returned have been prepaid. We make no warranty whatever in respect of tires, rims and batteries. The condition of this warranty is such that if the motor vehicle to which it applies is altered or repaired outside of our factory, our liability under this warranty shall cease. The

purchaser understands and agrees that no warranty of the motor vehicle is made, or authorized to be made, by this company other than that herein above set forth."

Burman to Drive Again—Charles Burman, who drove the Peerless in the Glidden tour, and who with W. C. Straub, his companion driver, registered a perfect score, has been asked by the company to drive in the tour of next year. Burman was the driver of a clean score car in the tour of 1906. It also is probable Straub will again be seen as a driver of a Peerless car in the Glidden tour of 1908.

Foolhardy Feat—J. Stanley Karp, a motor car owner of Niagara Falls, recently created much excitement in that city by driving his car across a dangerous railroad trestle. The machine crossed in safety, while several railroad men gazed in amazement. There is much traffic at the point where the feat was performed and that the motor car escaped meeting a train is miraculous.

Doubt the Doctors—It is believed by the Indianapolis police that the privilege recently given physicians of the city to break the speed laws when on emergency cases is being taken advantage of. Recently when a physician was arrested he was released in police court by Judge Thomas Whallon, who recommended that the physicians of the city carry a red cross when making an emergency run in their motor cars. A few days ago another doctor was arrested for fast driving and explained at the time that he was going to call on a patient. There were several persons in his car at the time and the remark of his driver that he "would break the police car that run him down into various kinds of pieces" led the police to believe that the physician was not acting in a professional capacity on the fast run.

New Way to Travel—Almost every tourist going from New York city to Cape May has found it impossible to take in Atlantic City on the way without making a long detour to avoid the bad roads between Atlantic City and Ocean City. The distance as the bird flies from Somers Point, just below Atlantic City, to Ocean City, directly across the mouth of the inlet, is 2.1 miles, but the distance by road is 27 miles of horribly sandy going. An innovation has been started within the last 10 days which enables any motorist to avoid this stretch of bad roads, and furnishes at the same time a novelty in the way of motor travel. The Shore Fast Line Trolley Co. has started a trestle and dike route from Somers Point to Ocean City. On Saturday, August 3, it opened up a flat car service to carry motor cars across the 2 miles of trestle. The first car to cross was a Stevens-Duryea big six, driven by S. H. Hancock. In the party were C. J. Neff, general superintendent of the electrified lines of the Pennsylvania railroad; Frank A. Broadhead, secretary and treasurer of the Atlantic Automobile Co.; A. E. Corbin, of the Stevens-Duryea Co.; James C. Ash and D. J. Jameson. The fare for the round trip is $5—$3 one way.

WHITE STEAMER THAT RUNS IN PRESIDENT ROOSEVELT'S SERVICE AT OYSTER BAY

Ride for Orphans—About 400 happy children of the Rochester orphan asylums recently toured the Flower City in motor cars as guests of the Rochester Automobile Club. The children were afterward taken to Ontario Beach park. The dignified members of the Rochester Automobile Club entered with spirit into the occasion.

Barred From Race Track—Another case where the motor car and the horse have clashed have come to light in Hornellsville, N. Y., where notices have been posted to the effect that motorists must keep off the race track at the Hornellsville fair grounds until after the fair, at the end of this month. The reason given is that the motor cars, which speed on the track, have been increasing in number to such an extent that it is found impossible to properly work out the race horses preparatory to the race meeting.

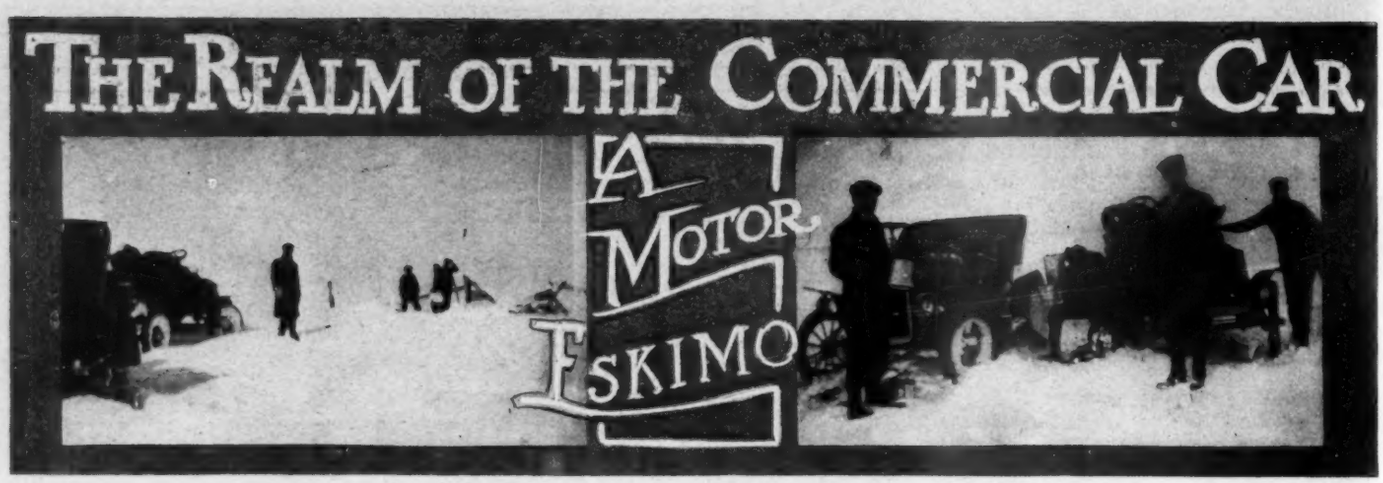
Exciting Chase—An exciting race was brought off at Van Wert, O., this week. A circular letter from Chicago was received stating that an Oldsmobile belonging to Jay C. Hills, of 1355 Wabash avenue, Chicago, had been stolen from 1536 Windsor street, Chicago, and giving a description of the machine and the supposed thief. D. R. McDonald who owns a garage at Van Wert, in passing along the street, thought he saw the stolen car standing in front of a restaurant. While he was locating the sheriff the tourist took his car and left. Another car was secured by the officer and the trail taken up. Upon coming in sight of the Oldsmobile the machines were given the right of way down the road for more than a mile and a half. The officer finally came in hailing distance and after discharging several shots, one of which took effect in the right hand of the fleeing driver, the capture was effected. The man gave the name of J. C. Hoffman, and maintains he was on a tour, with West Virginia as his destination. He is said to answer the description given in the circular, and is being held on suspicion, pending the arrival of Chicago officers.

Will Use Motor Cycles—Toledo now has a motor squad on the police force. Several experienced riders have been fitted out with motor cycles, and devote their time to scouring the city in the search for lawbreakers of all kinds. The primary object, it is said, was to enable the force to overhaul and detect violators of the speed ordinances. Thoughtless hucksters, who have neglected to pay their licenses, and other violators have also fallen victims to the new idea.

Building Many Bridges—Some idea of the bridge making that has been going on in Marion county, Ind., of which Indianapolis is the capital seat, is gained by a statement just issued by the commissioners of that county. In the last 3 years and 2 months the sum of $1,161,282.80 has been spent in this direction and the county now has some of the finest stone bridges in the United States. A new bridge, which will be the most substantial and ornamental in Indiana, is now under construction at the entrance to Riverside park.

Police Want Motor Cars—The Buffalo police commissioners are considering the advisability of installing two motor cars for service in the police department of that city next year. Recently the city bought a car for Fire Chief McConnell and it is believed by many that there is as much need for motor cars in the police department as in the fire department. Superintendent of Police Regan said: "Motor cars would be of invaluable service to the authorities in capturing criminals. I would favor placing cars in the fifth and tenth precincts for the reason there are smooth pavements there. When you get a hurry-up call for the patrol wagon in one of these districts the clatter of hoofs on the pavement in the stillness of the night would put any burglar on his guard and give him a fine chance to escape The motor car would be an improvement."

THE REALM OF THE COMMERCIAL CAR



THE GREAT SNOW STORM HELD THE MOTOR CARS IN ITS GRIP AND KILLED MANY CATTLE AND SHEEP

MOTOR AGE has in this department on previous occasions referred to the motor mail route between Roswell and Torrance, New Mexico, over which 100-mile course motor cars have been carrying the mails for considerably over a year. In constructing these roads for the cars it was necessary to go straight over the prairie. This made summer travel comparatively easy but took no recognition of the fact that sometimes nature becomes freakish, which it did on Sunday and Monday, November 18 and 19, last year, when an 18-inch snowstorm changed the entire condition of affairs and put the mail cars up against the stiffest work they have ever experienced. This great downfall not only astonished the entire population and killed many cattle and sheep and several men but put an absolute stop to all travel for the rest of that week. The snow, 18 inches on the level, was from 3 to 5 feet deep in the drifts. There were no trains for several days. It was at Roswell, in the southeastern part of that territory, where the race between the railroad and the motor car company in its effort to be the first to reach that city with mail, was watched with interest and where the motor car was given the honors of the race, notwithstanding the fact that the railroad did get a mail train into the city before a motor car was forced through the drifts that stopped even double-header trains for a period of 4 days. The motor car, handicapped a thousand fold as compared with the train, was the favorite in the race, and, once the road had been covered, made better time and kept a cleaner record than the railroad.

The story of how a motor car was driven through this great snow for a distance of 100 miles between the terminals of the Roswell-Torrance Auto Mail and Passenger stage, is one of privation and determination, as well as hardship and perseverance. On Sunday, with only a few inches of snow on the ground, a motor car started for Torrance at the regular time, 1 p. m., but the driver could go no farther than 6 miles, as the flakes were falling so thick and were being blown so hard directly in his face he could see no farther than 6 feet ahead of the machine and repeatedly lost his way across the prairie. After 2 hours' wait a second attempt was made, but this met with the same result as the first. The motor car from Torrance, coming with the storm, arrived only 1 hour late Sunday.

On Monday a motor car made a bold dash at the storm that still continued but could do no more than run 5 miles into the prairie and return. On Tuesday two cars were loaded with mail and started for Torrance, each driver having an assistant from the Roswell garage and being provided with shovels for digging their way through drifts. They made 35 miles the first day and when night came they had lost their way on account of the strange appearance of the prairie, which was piled in places with snowdrifts many feet deep. They had expected to at least reach Needmore, the half-way station, the first day, and had no cooked food, nor means to cook it. They dug a few mosquito roots, all they could find, and built a small fire and prepared to camp out for the night. The fire was so small it did no good and the only thing that saved the four men was to take turns at sitting on two carriage warmers which they had brought from the garage. The next morning the entire party abandoned the motor cars and went in search of shelter and to locate themselves. They found that they were but 5 miles from a ranch house, and the party spent Wednesday and Wednesday night there resting. Thursday morning they returned to the cars and found that one of them had lost its water. In the other they went to Needmore, and after another night's rest two of the chauffeurs took the car the entire distance to Torrance Friday, the snow having thawed considerably. On Saturday a motor car was run all the way from Torrance to Roswell, with its load of 1,000 pounds of mail, besides the men and tools. Since then the service had been regular each way daily, and will no doubt continue to be so, unless another record-breaking snow should fall.

CLUB HOUSE ON PINE LAKE

CENTURY BY COMMERCIAL CAR

On the occasion of the recent century run held on June 22 by the Detroit Automobile Club over country roads from Hotel Cadillac and ending at the club house on Pine lake, a twelve-passenger Rapid sightseeing car built by the Rapid Motor Vehicle Co., Pontiac, Mich., made the century with its full load of eleven passengers, covering the distance in 13 minutes longer than the time allotted the touring cars over the course. The car was a stock vehicle, not in any way prepared beforehand for the run, and made the trip over the hills and sandy portions of the road at an average speed of 22 miles an hour, and on good stretches traveled as high as 25 to 27 miles an hour. In speaking of this trip one of the passengers said:

"Promptly at 9:10 a. m. the judges gave us the signal to start. Over Washington boulevard from the Cadillac hotel we bowled at a good pace, and on out Woodward avenue. The rules of the contest required us to consume 25 minutes from the start to the toll gate just beyond the city limits. We reached the toll gate promptly and had our running card signed.

"Thence we proceeded out Woodward avenue road. The roads were good. At times the car was making 27 miles an hour. The rules obliged us to consume 5 minutes in getting through the little burg of Birmingham. From there we opened the throttle wide along the road to Pontiac, 24 miles from Detroit. Here we caught and passed one of the interurban trolleys. There was a big high-powered

RAPID SIGHT-SEEING TRUCK NO. 14 IN DETROIT'S CENTURY RUN AND A TYPICAL ROADSIDE SCENE

touring runabout containing only two men some distance behind us, but did not catch us until nearly at Pontiac.

"At Pontiac our motor was stopped for the first time and we did not again cease running until the end of the course was reached at the Club house, a distance of 75 miles. From Pontiac through the hamlet of Amy to Rochester we sped on magnificent roads, fairly level for the most part, and made excellent time, but from Rochester to Orion the quality of the roads deteriorated continually and rapidly until they became bad. Unfortunately some repairs had been made on the road just the day before and this rendered them even rougher going.

"The roads between Rochester and Orion not only got rougher but the topography of the country changed materially. It became first undulating, and then decidedly hilly, not to say mountainous. At one time after we had left Orion and were on our way back to Pontiac we came down a hill that was appalling in steepness when viewed from top to bottom. The hill was not only very steep but the road contained deep ruts, and halfway down had a sharp, bad turn. Our driver took us down with a hair-raising finish, but it was done so skilfully and withal so quickly that we barely had time to realize our temerity when it was all over. Going through those ruts in the road when we hit that turn at the middle of the hill it is a 9 days' wonder that we did not wrench our wheels off and roll over the side. The Rapid took the majority of those hills on the high speed. In only three or four instances was Driver Jacobs compelled to throw the clutch into the low speed.

"Being the only car of our kind entered in the event, the good-will of the spectators along the route was heartily with us and many were the rousing cheers of good luck that were given us throughout the run. We had now completed a little over half the course—56 miles, to be exact—and we again left Pontiac, this time taking a southwestern course and heading for Farmington. We left the more hilly section of the country and entered into what might be called the lake region—we exchanged the far reaching vista of hill and dale for the cool breezes, but the enjoyment of the beauties of nature was somewhat marred by bad roads. They were, if anything, worse, as for at least half of the distance they were composed of sand from 4 to 6 inches deep.

"But the scenery among these many lakes—Cass, Orchard, Orion, Sylvan and Pine—was beautiful. Our road wound in and out along the shores of these lakes, at times going right down to the edge of the water, and despite the sand of the roads I believe, so far as my personal preference is concerned, that this was the most pleasurable portion of our trip.

PHOENIX'S GOOD WORK

The 3-ton Phoenix truck built by the Kansas City Motor Car Co., Kansas City, Mo., has been doing constant demonstrating work in its home state since it was placed on the market last spring. Much of this work has been of the hard variety and intended to thoroughly test the construction and endurance of the truck. This Phoenix truck was put on the road May 15 and has since covered 2,500 loaded miles without repairs. During this time the truck was laid up for 11½ hours, occasioned by the replacement of the home-made magneto by one of Sims-Bosch make. A portion of this time was used in changing the radiator, which developed a leak. The remainder of the 11½ hours was taken up by the carbureter adjustment. Since the truck was placed on the road its average hauling cost per ton-mile has been 9¾ cents. This includes a 10 per cent depreciation, $250 per year for tire replacements, $18 per week driver's wages and gasoline and lubricating oil. These figures are taken from work over rough roads with continually changing grade, which is characteristic of Kansas City. On one occasion the truck slid into an 18-foot ravine with a full load, caused by the giving away of the road bed. After it was hauled from its up-side-down position the engine started at the first turn of the starting crank. The only damage was the breaking of the wood of the steering wheel.

SNOW! SNOW! EVERYWHERE

WANTED—A FACTORY

A. W. Larkins, 214 Upper First street, New York city, is looking for a factory that will build for him a traction outfit designed expressly for hauling logs and working in and around lumber camps. The outfit contemplated consists of a kerosene tractor pulling two trailers, each with a carrying capacity of from 15,000 to 20,000 pounds. The tractor is to be fitted with a multi-cylinder, 80 to 90-horsepower motor, using kerosene as a fuel, and weighing approximately 4,000 pounds. The tractor carrying the motor will have 44-inch wheels fitted with 16-inch tires, the treads of which are to be provided with transverse iron bars to increase adhesion. The trailers will have 44-inch wheels with 16-inch tires. From the motor power is to be transmitted through a cone clutch in the flywheel to a three-speed and reverse sliding gearset, and thence by bevel gears to the rear axle. From the tractor the power is to be conveyed to the first trailer through two universal joints and sleeve couplings to bevel gears on the rear axle of this trailer. This portion of the device will resemble the principle used in the Renard train, in which there is a transmission of the power from the tractor through a continuous universal joint shaft to the driving axle of each car throughout the train. The promoter claims that in hauling logs and lumber from the forest over dirt roads to the railroads in competition with mules, as used at present, the kerosene tractor will show up favorably well.

AMONG THE MAKERS AND DEALERS

Receiver Appointed—A receiver has been appointed for the St. Louis Motor Car Co., of Peoria. The assets amount to about $100,000, while the liabilities will be about $20,000 more.

Now Permanently Located—The Electric Storage Battery Co., of Philadelphia, has removed its San Francisco sales offices from the temporary location at 11 Hawthorne street, to the Crocker building, San Francisco, where it will be permanently located.

First '08 Locomobile Out—Bill Hall had the honor of giving the first 1908 Locomobile its final test at Bridgeport, Conn. Accompanying him was A. L. Riker, the designer, who occupied a seat in the tonneau. The car had received its rough test some time ago.

Completes European Deal—B. C. Swinehart, vice-president of the Swinehart Clincher Tire and Rubber Co., of Akron, O., has returned from Europe after a 3 months' stay, during which he negotiated the sale of German patents to Metzeler & Co., of Minchen, Bavaria, and also licensed a European concern to manufacture Swinehart tires in England.

Partnership to Be Dissolved—There are negotiations pending at Columbus looking to the dissolution of the partnership of O. G. Roberts and Richard Hammond, owners of the O. G. Roberts Automobile Co. It is understood that Roberts will purchase the interest of Hammond in the business and will run the concern in his own name in the future.

Craig-Toledo in Court—A petition in voluntary bankruptcy was filed last week in the United States courts in Toledo by the Craig-Toledo Motor Co. The action was not wholly unexpected. A short time ago the garage on Madison avenue was removed to the Coliseum, where it was consolidated with the Pope-Toledo garage. The total liabilities of the concern are given as $45,546.70, while its assets are but $32,016.09. The company has been doing business in Toledo for more than a year past.

Ford Sales in New York—Claim is made that Ford runabouts and sixes to the value of $190,059.43 were sold and delivered from the New York branch store during the month of July alone. During the 10 months dating from October 1, the beginning of the Ford fiscal year, Gaston Plantiff has disposed of $920,000 worth of Ford cars. This included about 1,400 runabouts and 130 six-cylinder touring cars —nearly one-seventh of the entire Ford output. In speaking of his achievements, Plantiff says: "Nothing is carried over from previous months and only those sales are included in the month's report which have been made and delivered in that month. We marketed almost as many cars in December as we did in April, and while July was our biggest month, the June sales amounted to $147,000."

FIRST 1908 LOCOMOBILE ON ROAD

Marvel in Trouble—Petitions were filed in the United States court in Detroit last Friday by the Long Mfg. Co., of Illinois; the Milton Mfg. Co., of Pennsylvania, and the Class Journal Co., of New York, asking that the Marvel Motor Car Co., of Detroit, be adjudicated a bankrupt. The petitioners allege that the company has committed acts in bankruptcy during the last 4 months in transferring three cars to Charles W. Munz, with the intent to prefer him over other creditors. The Long Mfg. Co. claims an indebtedness of $1,333.35; the Milton Mfg. Co., $52.86, and the Class Journal Co., $591.65.

Coast Man in East—Volney S. Beardsley, sales manager of the Auto Vehicle Co., of Los Angeles, Cal., maker of the Tourist car, has invaded the east. Shiping a Tourist car to Chicago, he and his wife are traveling in it to Pittsburg, where the car will be delivered to a customer and visits made to Washington and New York, after which Mr. Beardsley will return by way of the southern route. Mr. Beardsley says his company will make 1,000 cars this year, the line consisting of two and four-cylinder models. The Tourist has been most successful on the coast and in the last 4 months it has taken part in twenty-six events, consisting of hill-climbs, speed tests and endurance runs, winning twenty-three of them. Mr. Beardsley is particularly proud of the recent performance of a 1,300 two-cylinder Tourist, which, carrying four passengers, won a 25-mile race, averaging 50 miles an hour, which he claims is a world's record for that price of machine.

Franklin Secures Location—The Franklin Automobile Co., the title of the H. H. Franklin Mfg. Co.'s New York branch, is to be located in the Severn building at the southeast corner of Amsterdam avenue and Seventy-third street and not in the former Aerocar quarters at Seventy-third and Broadway as heretofore erroneously published.

Spalding in Game—The Stevens-Duryea car, which has for several years been represented in Philadelphia by the Eastern Automobile Co. at 340 North Broad street, will be looked after in the Quaker City in the future by A. G. Spalding & Brothers. Pending the securing of suitable quarters, the Spaldings have established temporary offices at 336 North Broad street.

Has a Good Trip—H. B. Larzelere, sales manager of the Chadwick Engineering Works of Philadelphia, has just returned from the west. During his 2-weeks' trip he effected a lodgment for the Chadwick in Chicago, the agency having been placed with the Hamilton Automobile Co., 1218-20 Michigan avenue. Mr. Larzelere reports that work on the company's new plant at Pottstown, Pa., is proceeding rapidly and it is proposed to occupy it by November 1.

New York Enterprise—The latest additions to the ranks of the New York Automobile Trade Association are Ciomiotti Brothers, agents for the Mora car; the Corbin Motor Vehicle Corporation, and the Waltham Mfg. Co. The association has just established a collection department for the benefit of its members, and has under consideration the organization of an employment bureau through which members may secure reliable salesmen, mechanics or chauffeurs.

Chicago Changes—There will be a general shifting of managers of branch houses in Chicago this fall. C. M. Brown, manager of the Winton branch, has accepted a call to San Francisco to take charge of the new Winton branch that is to be opened in that city by the Winton company. His successor will be B. C. Day, who has been associated with Mr. Brown for some time. Fred E. Dayton, manager of the Chicago branch of the Electric Vehicle Co., has accepted the position of assistant to H. W. Kyte, third vice president of the Electric Vehicle Co., and will return to Hartford, his old home. His successor has not been named. Another change is the resignation of Joseph F. Gunther as manager of the Rambler branch. The resignation takes effect about

the middle of next month. Mr. Gunther is president and Mr. Dayton secretary of the Chicago Automobile Trade Association.

Factory for Buenos Ayres—The motor car company in Buenos Ayres—there is only one—has decided to build a factory. The name of the company is Cie des Voitures Automobiles.

Benz Making Money—The Benz motor car works in Mannheim, Germany, have issued a balance sheet showing a profit of $273,497 for the fiscal year 1906-7, as against $159,699 for the preceding year. They pay a 15 per cent dividend, against 7 per cent for 1905-6.

Leases Broad Oak Garage—The R. O. Williams Automobile Co., recently incorporated with an authorized capital of $50,000, will be located in Columbus, having taken a lease on the Broad Oak garage, which it will conduct in the future. The new company will elect officers soon, issue its stock and begin operations.

Company in Trouble—A petition has been filed by the R. S. Albright Co., Hunt & Motter and J. A. Wolfe asking that W. O. Williams, trading as the Reliable Automobile Co., of Tacoma, Wash., may be declared bankrupt. O. F. Cooper has been appointed receiver. The liabilities are estimated at $25,000 and the amount of the assets is not yet known.

Miley Makes a Change—C. D. Miley, long connected with the Chicago branch of the Diamond Rubber Co., has resigned his position to accept the position of sales manager of the Kisselkar company, of Hartford, Wis. He will make his headquarters in Chicago with the Webb Jay Motor Co. and for his territory has the states of Wisconsin, Iowa, Illinois and Indiana.

Need More Room—So rapidly has the business of James L. Gibney & Brother, Philadelphia Firestone and Continental tire agents, expanded that that concern's establishment at 211-213 North Broad street has proved entirely inadequate. Last week the second floor of the big building was taken over by the Gibneys, and after the office parphernalia has been installed there the entire first floor will be devoted to salesroom purposes.

Couzens Coming Home—A cablegram received by Henry Ford states that James Couzens sailed for home on August 14. Mr. Couzens is secretary and treasurer of the Ford Motor Co. and also manager of the sales department of the concern. Two months ago he began a tour of continental Europe and Great Britain for the purpose of studying conditions there and laying plans for a big export business in Ford cars. During the time he has been away Mr. Couzens has visited every country and every city of importance in the old world and has gained much valuable information for his company. The Ford company is already shipping twenty-four runabouts per week to London, sixteen to Berlin and eight each to Paris, Milan and Brussels.

Looking for Factory Site—The Harmer Motor Car Co., of Toledo, recently incorporated for the purpose of manufacturing an air-cooled motor car, has not yet selected a site for the proposed new factory. Frederick S. Harmer, the inventor, has opened offices in Columbus, which will be used for draughting purposes.

Tire Concern Incorporated—The Empire State Tire Co., which will build and operate a motor car tire factory in Buffalo, has been incorporated. The directors are William F. McClurg, A. McClurg and Sylvanus B. Nye. The company, it is said, will manufacture a patented puncture-proof tire, consisting of a layer of overlapping steel disks embedded in rubber, to be placed between the inner and outer tubes of the tire.

Franklin Adds to Plant—The H. H. Franklin Mfg. Co., of Syracuse, has been obliged to greatly enlarge its facilities on account of the rapid increase in business. For this purpose the company has leased for 2 years the plant of the old Syracuse Bicycle Co., in West Genesee street. There are two large buildings on this property, one five stories and the other four stories, covering 35,000 square feet of space. The new quarters are to be occupied by the sundry stock, painting and finishing departments.

Ask for Space in Palace—Already more than 16,000 square feet of space have been applied for in the independent show in the Grand Central palace, October 24-31, with the date for closing almost 2 weeks away. According to the plan formulated by the American Motor Car Manufacturers' Association, all applications for space fon the Grand Central palace show must be in the association's office by Wednesday, August 28. The drawing will be on Friday, August 30, in the headquarters of the association, 29 West Forty-second street, New York city. Several new features will be introduced regarding tickets and badges, chief among which will be a double check system for exhibitors. Upon written application to the committee, giving in detail the names and duties of persons for whom application is made, each exhibitor will receive an admission badge and ticket for his own use and for each employe necessary for the proper conduct of his exhibit. These badges are not transferable, and in case of transfer will be taken up and considered forfeited. The badge is not good for admission in itself, except when used in connection with an admission ticket. On entering the building an exhibitor or employe will be required to exhibit the badge and deliver the ticket to the doorkeeper. Upon leaving the building he will exhibit the badge to the doorkeeper, and will be given a ticket which, in combination with the badge, will be available for his next admission. He can obtain admission only by exhibiting the badge and delivering the ticket.

Pardee Resigns—Fred J. Pardee has resigned his position as sales manager of the St. Louis Car Co., of St. Louis, maker of the American Mors.

Moline Opens a Branch—The Moline Automobile Co., of Moline, Ill., formerly represented in Chicago by C. P. Warner & Co., has decided to open a branch. It has secured quarters at 1404 Michigan avenue, and W. J. Boone, formerly with the Northern agents in Chicago, has been appointed manager.

Changes to Steam—Frank W. Stockbridge, who has been connected with various concerns in Philadelphia for the past 3 years, including the Reo and Cadillac agencies, has eschewed gasoline and will in the future talk steam. The Philadelphia branch of the White company has secured his services, and he has been assigned to look after the rapidly-growing business of the company in the country tributary to the Quaker City branch. He has a good knowledge of steam cars, having been foreman of the assembling room of the Locomobile company.

Webb Jay's Plans—Announcement is made by Webb Jay that the Webb Jay Motor Co., of Chicago, will open a salesroom on the row about October 1, having secured quarters on the second floor of the new Harvester building at 238 Michigan avenue, where it has two rooms, one 50 by 30 feet and the other 25 by 16 feet. The company has 20,000 square feet of space in its factory at State and Twenty-third streets and expects to have the first model of its new steam car ready in about 2 weeks. In addition to the Webb Jay steamer the company will continue to handle the Stanley steamer. Another deal was consummated this week whereby the Jay company will handle the output of the Kisselkar company, of Hartford, Wis., in the central states, having contracted for 300 of the 1908 models.

Denies Garford Merger—The Cleveland Motor Car Co., having heard rumors that it had been absorbed by the Garford company, has issued an official denial, at the same time making an announcement of its 1908 plans. It will market 250 cars and will have two models—a touring car and a roadster, both with 40-horsepower motors. The front axle will be carried forward flush with the radiator and the latter will be of the Mercedes type and shape. The company adds that heretofore the Cleveland chassis has been identical with those of two other makes. Hereafter, though, the Cleveland chassis will be of entirely different construction. Announcement is also made that the Cleveland Motor Car Co. has sold its plant in the Whitney Power block to the Garford company, the transfer to take place on September 1. The new location of the Cleveland company will be announced on September 1.

DON'T TIE UP

to the first 1908 model that you see, and then find it outclassed by the magnificent new

WINTON

¶ This latest production of the Winton factories is so far ahead of the field that you'll only need to see it to fall in love with its beauty of appearance and performance.

We shall demonstrate the 1908 Winton at a very early date in

NEW YORK	PHILADELPHIA	CHICAGO	SAN FRANCISCO	BOSTON
PITTSBURG	CLEVELAND	DETROIT	SEATTLE	LOUISVILLE
CINCINNATI	NEWBURG	TOLEDO	PORTLAND	NEWARK
LOS ANGELES	TROY	HARTFORD	SALT LAKE CITY	ROCHESTER
OMAHA	BALTIMORE	SAN JOSE	WASHINGTON	SYRACUSE
ST. LOUIS	DENVER	TAUNTON	LINCOLN	ALBANY
TORONTO	MILWAUKEE	BROOKLYN	SPRINGFIELD, MASS.	MIDDLETOWN
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Deliveries will start early enough to give you an abundance of 1908 enjoyment before 1908 gets here

¶ The entire output of this new model will be limited to

500 -- Cars -- 500

¶ The distribution of output has been arranged to give each purchaser the advantage of owning and driving a car that will give him distinction in his home city.

¶ Full descriptive matter will be ready within two weeks. Shall we send you the news? Write

The Winton Motor Carriage Co.

Member A. L. A. M.

Cleveland, Ohio, U. S. A.

New York Boston Philadelphia Pittsburg San Francisco Chicago Detroit Seattle